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(54) **CONTINUOUS STILL PICTURE INFORMATION RECORDING METHOD AND INFORMATION REPRODUCING DEVICE**

(57)Abstract:
PROBLEM TO BE SOLVED: To provide the data structure of recording format and managing information for handling plural pieces of still picture information.
SOLUTION: An information storage medium capable of recording and reproducing the still picture information at least has first information units VOBU 1641-1649 having one piece of still picture information and first group units VOB 1632-1634 or PTT 1407 and 1408 composed of the set of first information units while having plural pieces of still picture information with different contents, and information is recorded for the first group unit.

CLAIMS

[Claim(s)]
[Claim 1]In a method of recording information on an information storage medium in which record and reproduction of still picture information are possible at least, Build the 1st information unit that has the still picture information of one sheet, and build the 1st group unit that has the still picture information of contents from which it is constituted by aggregate of said 1st information unit, and plurality differs, and. An information storage method, wherein said thing [recording information per 1st group and having enabled it to record two or more still pictures continuously].
[Claim 2]The 1st record section that is how to record information on an information

storage medium in which record and reproduction of still picture information are possible at least, and records the still picture information itself.

The 2nd record section that records management information about a still picture.

Are the information storage method provided with the above, and build the 1st group unit that has the still picture information of contents from which it is constituted by aggregate of the 1st information unit that has the still picture information in every sheet, and said 1st information unit, and plurality differs, and. Still picture information is recorded on the 1st record section of the above per 1st [said] group, and, moreover, management information about still picture information in every sheet related to the 1st information unit of the above records two or more still pictures which have the recorded map information continuously.

[Claim 3]When recording information on an information storage medium characterized by comprising the following, in a control information recording area of the above 2nd, record minimum unit information which reproduces the above-mentioned still picture information, and. An information storage method which records continuously two or more still pictures specifying the still picture itself reproduced using the above-mentioned minimum unit information.

The 1st record section that records the still picture information itself on an information storage medium in which record and reproduction of still picture information are possible at least.

The 1st control information recording area where information about a recorded state on an information storage medium of still picture information which has the 2nd record section that records management information, and was recorded in a management domain of the above 1st in a record section of the above 2nd was recorded.

The 2nd control information recording area where information about a regeneration method in a case of reproducing still picture information recorded in a record section of the above 1st was recorded.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates two or more still pictures to record, a refreshable information storage medium, its record method and a device, its reproduction, and playback equipment.
[0002]
[Description of the Prior Art]A digital camera has come to be frequently used these days as a medium which records still picture information by digital information. Video information is recorded by digital information and menu images are displayed with the still picture also in DVD to reproduce.
[0003]Here, in the digital camera, photoed one-sheet the still picture of one sheet is stored as a separate file. Thus, when the still picture information in every sheet is divided and saved at each file, the following technical problems are left behind.
[0004]a] Since a grouping is not carried out for every still picture photoed at the similar the same period as the contents of a still picture, management and search of each still picture become complicated.
[0005]b] Although each contents of still picture information are checked as one of the concrete contents of the complicatedness of management of a still picture, it is necessary to open a file independently, and content confirmation takes time and effort.

[0006]c] the recording which secured a DVDVideo disk, and a certain amount of compatibility and continuity -- when also trying to treat two or more still picture information in a refreshable DVD disk, it becomes impossible to maintain the compatibility and continuity between DVDVideo disks

[0007]Then, this invention does the following things for the purpose.

[0008]A) Improvement about a recording format when recording still picture information on an information storage medium.

[0009]B) Improvement about the data structure of the management information to the still picture information recorded on the information storage medium.

[0010]C) Improvement about the information storage playback equipment which records still picture information and its management information on an information storage medium.

[0011]D) Aim at the improvement about the information reproducing device which reproduces the still picture information which record and is in an information storage medium, and its management information.

[0012]Specifically, A) the recording which secured the compatibility and the continuity of a DVDVideo disk and the existing grade, securing the recording format between the general image methods, the data consistency of management information, and continuity in a refreshable DVD disk. It aims at offer of the recording format for dealing with two or more still picture information, the data structure of management information, and the information storage playback equipment that makes it possible.

[0013]B) offer of the recording format for making easy management and search to two or more recorded still picture information, the data structure of management information, and the information storage playback equipment that makes it possible -- aim at things.

[0014]C) Aim at offer of the information reproducing device for enabling the display of two or more [continuously] still picture information [be / no intermission] (continuity at the time of reproduction) by enabling high-speed access to the information storage medium with which two or more still picture information was recorded.

[0015]
[Means for Solving the Problem]In order to attain the above-mentioned purpose, continuous recording of the still picture information of two or more sheets is carried out by carrying out the grouping of two or more still picture information collectively, and recording information which carried out the grouping on an information storage medium. -- Between still pictures of at least two sheets, it is continuously recorded on a place which approached mutually on an information storage medium among two or more still picture information by which the grouping was carried out.

[0016]Map information by which information about each still picture information (for example, recording address on an information storage medium of each still picture information, etc.) was recorded on a part of management information about information which carried out the grouping is given.

[0017]
[Embodiment of the Invention]Hereafter, this embodiment of the invention is described with reference to drawings.

[0018][1] Explain below the contents of recorded information (data structure) of the information recorded on the information storage medium (Optical Disk 1001) in which the rec/play of the video information and music information which are shown in the data outline structural drawing 1 on an information storage medium (a) is possible.

[0019]As shown in drawing 1 (b) as a rough data structure of the information recorded on an information storage medium (Optical Disk1001). Embossed data Zone (ene BOSUDO zone) to which - light reflection surface made uneven shape order from the

inner circumference side (Inner Side 1006). Mirror Zone (mirror zone) with the flat (mirror plane) surface, and Rewritable data Zone (rewritable zone) which can rewrite information Lead-inArea 1002 which it had.

[0020]It is recorded on Rewritable data Zone in which the record and rewriting by a user are possible, Volume & File Manager Information(BORIUMU and file manager information) 1003 on which the information about the file or entire volume of Audio & Video Data was recorded.

[0021]- It consists of Rewritable data Zone in which the record and rewriting by a user are possible. Data Area(data area)1004.

[0022]- Lead-out Area(read out area) 1005 which comprises Rewritable data Zone which can rewrite information. It is alike and is divided.

[0023]Information about the whole information storage medium, such as a physical sector number which shows Embossed data Zone of Lead-in Area 1002 the disk type of -DVD-ROM/-RAM/-R, disk size, storage density, and a recording start/recording end position.

[0024]- Information about record, reproduction, and erasing qualities, such as record power, recording pulse width and erase power, reproduction power, and linear velocity at the time of record and elimination.

[0025]- The information, including a serial number etc., concerning manufacture of the information storage medium per sheet respectively is recorded a priori, To Rewritable data Zone of Lead-in Area 1002, and Rewritable data Zone of Lead-out Area 1005, respectively The peculiar diskname record section for - each information storage medium of every, - A trial recording field (for the check of record deletion conditions), and -Data Area 1004 It has a management information recording region about an inner defect region, and record by information storage playback equipment is attained to the described area.

[0026]Between Lead-in Area1002 and Lead-out Area1005. Be shown in drawing 1 (c) Data Area1004 inserted. Computer Data (computer data) and Audio & Video Data (audio and video data) Mixture record is attained. The recording order of Computer Data and Audio & Video Data and each recorded information size are arbitrary, The field which called the place in which Computer Data is recorded, and which exists Computer Data Area 1008 and 1010 and where Audio & Video Data was recorded is named Audio & Video Data Area1009.

[0027]Audio & Video Data Area 1009 the data structure of the information recorded inside like drawing 1 (d). - Anchor Pointer forControl Information (anchor pointer for control information) 1015 : Audio & Video Data Area 1009 It is arranged at the position of the inner beginning, Control Information (control information) in Audio & Video Data Area1009 Information which shows the head position (start address) on which 1011 is recorded.

[0028]- Control Information 1011 : Recording (sound recording), playback, edit, search Control information required when performing each processing.

[0029]- Video Objects 1012 : Recording information of Video Data contents (Contents).

[0030]- Picture Objects(picture object)1013 : Still (still) picture Slide (slide) picture etc. -- still picture information.

[0031]- Audio Objects (audio object) 1014 : Recording information of Audio Data contents (Contents).

[0032]- Thumbnail Objects(thumbnail object)1016 : Information, including the thumbnail (Thumbnail) etc. which are used at the time of edit when searching the place in Video Data to see. It comprises ****.

[0033]Video Objects1012 of drawing 1 (d), and Picture Objects1013, AudioObjects1014 and Thumbnail Objects1016 mean the meeting (group) of the

information classified into every contents of contents (data contents), respectively. Therefore, all the video information recorded on Audio & Video Data Area 1009 is included in Video Objects 1012, All the still picture information is included in Picture Objects 1013, all the audio sound information is included in Audio Objects 1014, and all the thumbnail information that it is used for management and search of video information is included in Thumbnail Objects1016.

[0034]Drawing 3 showed. With VOB(Video Object)1403. AV File (the Ey buoy file, i.e., an audio video file) 1401 The lump (settlement) of the information recorded inside is shown and it has become a different definition from Video Objects1012 of drawing 1 (d). Although the similar term is used, since it is used in a completely different meaning, cautions require.

[0035]Furthermore, the contents of Control Information1011 are - AV Data Control Information (AV information control information). 1101 : Video Object 1012 An inner data structure is managed, It is certain OpticalDisk1001 with an information storage medium. Management information of the information about the upper recording position. [0036]- Playback Control Information (playback control information) 1021 : Control information and Recording Control Information(recording control information) 1022. [required at the time of reproduction] : Control information required at the time of record (recording and sound recording). [0037]- Edit Control Information(editing control information) 1023 : Control information required at the time of edit. [0038]- Thumbnail Control Information(thumbnail control information) 1024 : It has the management information about the object for place search or the thumbnail for edit (Thumbnail Object) in VideoData to see, etc.

[0039]AV Data shown in drawing 1 (e). Control Information1101 An inner data structure is - Allocation Map Table(allocation map table) 1105. : Address selection which met the actual arrangement on an information storage medium (Optical Disk 1001), Information about discernment of having existing recorded and sheep recording area, etc. [0040]- Video Title Set Information (video title set information) 1106 : Be shown in drawing 3. AV File1401 Inside Overall information content is shown, They are hour entries, such as grouping information of VOB, and TimeMap Table, for the relation information between each VOB, and management and search two or more.

[0041]- Video Object Information 1107 (video object information) : it is shown in drawing 3 (c) -- as -- every in AV File1401 -- information about each VOBU which shows the information about VOB each and is contained in the attribute (characteristic) information for every VOB, or VOB.- PGC Control Information(program chain control information) 1103 : Information about a video information reproduction program (sequence). [0042]- Cell Playback Information(cell reproduction information) 1108 : Information about the data structure of the video information basic unit at the time of reproduction.It is ** constituted.

[0043]If even (f) of drawing 1 is surveyed, it will become the above-mentioned contents, but some explanation supplement is performed to below to each information.

[0044]Information concerning the whole - Volume in Volume & File Manager Information(BORIUMU and file management information) 1003.

[0045]- The number of files about the number of files of PC data contained, and AV information.

- Record layer information.The information about **** is recorded.

[0046]It is - especially as record layer information. The number of composition layers (example: as for one RAM/ROM two-layer disk, two layers and one ROM two-layer disk also count two layers and n single-sided disks as an n layer). [0047]- The logical sector range-of-number table assigned for every layer (capacity for every layer). [0048]- The characteristics for every layer (example: the RAM part of a DVD-RAM disk and a

RAM/ROM two-layer disk, CD-ROM, CD-R, etc.). [0049]- The allotment logical sector range-of-number table in the Zone unit in the RAM area for every layer (the rewriting feasible region information capacity for every layer is also included). [0050]- Original ID information (-- in order to discover disk-swapping in a multiple-string disc pack) for every layer It is recorded, the logical sector number which continued also to the multiple-string disc pack or the RAM/ROM two-layer disk is set up, and it can treat now as one big Volume space. Information about the reproduction sequence which unified - PGC in Playback Control Information 1021. [0051]- It is related above and is VTR about an information storage medium. Information which shows the false recording position it was considered like DVC that was one tape (sequence which plays all the recorded Cell(s) continuously). [0052]- Information about two or more screen simultaneous reproduction with different video information.
[0053]- search information -- it corresponds for every search category. Cell ID -- the -- Cell -- information which the table of inner start time is recorded, and a user chooses a category, and makes possible direct access to applicable video information.
[0054]**** is recorded. - program timed recording information etc. are recorded on Recording Control Information1022. furthermore -- Edit Control Information 1023 - every -- inverted print information on a PGC unit (-- applicable time setting information and the contents of inverted print are indicated as EDL information). [0055]- File conversion information (-- the particular part in AV file is changed into the file which can perform inverted print on PCs, such as an AVI file, and the place which stores the file after conversion is specified) It is recorded. Thumbnail Control. To Information 1024 -. management information about Thumbnail Objects 1016 (-- Audio & Video DataArea 1009 -- the specification information on VOB related to the recording place of a thumbnail image and each thumbnail image in every sheet inside, or Cell.) each thumbnail image is related VOB -- or -- Cell -- inner place information (if attached to VOB and Cell, the contents explanation place of drawing 3 explains in detail) etc. are indicated.
[0056]Inside of Data Area Data Area1004 of directory structure drawing 1 (b) of a data file All the information recorded inside is recorded by a file basis, and the relation during each data file is managed by directory structure, as shown in drawing 2.
[0057]Under the root directory 1450, for every file content recorded, two or more subdirectories 1451 are installed so that easily [a classification]. Each data file about ComputerData recorded on Computer Data Area1008 of drawing 1 (c) and 1010 in the example of drawing 2 is an object for Computer Data preservation. It is recorded under the subdirectory 1457, Audio & Video Data recorded on Audio & Video Data Area1009 Rewritable video title set It is recorded under RWV_TS1452. Again When the video information currently recorded on the DVDVideo disk is copied to drawing 1 (a) Video title set VIDEO_TS1455 Audio title set It copies under AUDIO_TS1456.
[0058]Control Information 1011 of drawing 1 (d) Information is recorded as one file as rec/play video control data. In the example of drawing 2, the file name has named RWVIDEO_CONTROL.IFO. It has recorded on backup by the file name to which the same information is said as RWVIDEO_CONTROL.BUP.
[0059]In the example of drawing 2, Video of drawing 1 (d). They are all about Objects 1012, Picture Objects1013, Audio Objects1014, and Thumbnail Objects 1016. As AV File1401 (the file name in the example of drawing 2 is RWOBJECT.alumnus). It is recording on one file collectively. Although not illustrated to drawing 1, the rec/play additional information 1454 which can be used at the time of recording playback of an image is simultaneously recordable, the information is collectively recorded as one file, and the file name called RWADD.DAT is attached in the example of drawing 2.
[0060]AV File Inner data structure AV File An inner data structure is shown in drawing

3. As shown in drawing 3 (b), one VTS(VideoTitle Set; video title set)1402 consists of the AVFile 1401 whole. The inside of VTS1402 Audio & Video. The contents of Data AV File 1401 Plurality separated in accordance with an order of the information recorded inside It consists of the meeting of VOB(Video Object; video object)1403, and 1404 and 1405.

[0061]Drawing 3 (d) VOB1403, and 1404 and 1405 AV File1401 It defines as a settlement of Audio & Video Data recorded inside, It has a different definition content from Video Objects 1012 shown in strong drawing 1 (d) of classification item colors, such as video information / still picture information / audio information / thumbnail information. Therefore, drawing 3 (d) There is nothing only by the information classified into Video Objects 1012 being recorded in VOB1403, and 1404 and 1405, The information classified into Picture Objects1013, Audio Objects 1014, and Thumbnail Objects1016 as shown in drawing 10 is also recorded.

[0062]each -- There is relevance based on information content (contents) recorded in VOB 1403, 1404, and 1405. performing a grouping to every VOB -- every group It is collected as PTT (Part_of_Title; par TOOBU title) 1407 and 1408. Jam PTT 1407 and 1408 is one piece or plurality. It is constituted as an aggregate of VOB. In the example of drawing 3 (c) Two pieces, VOB 1404 and VOB 1405, With VOB PTT1408 is constituted and PTT1407 is one piece. It comprises only VOB.

[0063]Minimal-basis book unit of video information It is referred to as VOBU (Video Object Unit; video object unit) 1411-1414, the data in VOB1403 - 1405 is shown in drawing 3 (e) -- as -- this -- It is constituted as an aggregate of VOBU 1411-1414. the video information compression technology of VOB1012 -- MPEG1 -- or -- MPEG 2 is used in many cases. MPEG -- video information -- about -- 0.5 second Cut fine and come out. dividing into the group called GOP -- this -- Video information is compressed in the GOP unit. this -- The almost same size as GOP Synchronize with GOP. The video information compression unit of VOBU (Video Object Unit) 1411-1414 is formed.

[0064]Furthermore, this VOBU 1411-1414 is divided and recorded on Sector(sector)1431 of a 2048Bytes unit - every 1437, respectively. In each Sector 1431-1437, it is Pack (pack), respectively. It is recorded with the form of structure, For every Pack, raw video information, sub video information, speech information, dummy information . V_PCK(Video Pack) 1421-1425, 1426 and 1427, SP_PCK(Sub-picture Pack; sub video image pack) 1422, A_PCK(Audio Pack; audio pack) 1423, DM_PCK (Dummy.) Pack; it is recorded in the form of the straw-man pack 1424. In the head of each Pack, it is Pack Header (pack header) of 14Bytes. Since it has, the amount of information recorded in each Pack is 2034Bytes.

[0065]Here DM_PCK(Dummy Pack) 1424 is an object for the ex post facto addition of the postscript information after - recording. -- The memorandum information which puts postrecording in Audio Pack and is exchanged for Dummy Pack is inserted in sub video information (inside of Sub-picture Pack). It is inserted a priori by the purposes of use, such as Dummy Pack and ******.

[0066]The record section of the DVD-RAM disk which is an example of the information storage medium (Optical Disk1001) shown in drawing 1 (a) is divided into two or more sectors (Sector). The data volume of 2048Bytes is recordable per one sector. this -- DVD-RAM disk **** -- record and playback in a sector (2048Bytes) unit are performed. therefore -- as an information storage medium (Optical Disk1001) DVD-RAM disk when it uses, it is shown in drawing 3 (f) -- as -- every -- Pack is recorded in Sector1431 -1437 unit.

[0067]it is shown in drawing 3 (b) and (d) -- as -- AV File 1401 -- inside -- all -- A series of relation of VOB 1403-1405 VTS(Video Title Set)1402 is constituted. In the reproduction procedure described by Playback Control Information(pack control

information) 1021 to it, it is arbitrary. VOB It is possible to specify inner ranges arbitrary moreover and to reproduce by arbitrary reproduction order moreover. Video information basic unit at the time of reproduction It is referred to as Cell 1441, 1442, and 1443. Cell1441, and 1442 and 1443 are arbitrary. VOB Although inner ranges arbitrary moreover can be specified, it cannot straddle and VOB cannot be specified (two or more VOB(s) are connected by one Cell, and the range cannot be set up).

[0068]Cell 1441 is at the example of drawing 3 (g). VOB 1403 One piece VOBU 1412 is specified, Cell 1442 is one piece. VOB 1404 Specifying the whole, Cell 1443 is. VOBU 1414 The range only of an inner specific pack (V_PCK 1427) is specified.

[0069]Information which shows a video information reproduction sequence It is set up by PGC(Program Chain)1446 and this reproduction sequence is one piece. Cell Specification or plurality It is described by the relation information on Cell. In for example, the example of drawing 3 (h) PGC(Program Chain)1446 constitutes the reproduction program as relation of Cell1441, Cell 1442, and Cell 1443 (the detailed explanation about the relation between Cell and PGC is mentioned later).

[0070]As the contents above-mentioned of Allocation Map Table was carried out, the record section of a DVD-RAM disk is divided into two or more sectors (Sector), and it continues in ascending order sequentially from the inner circumference side, and the sector number (LSN: Logical Sector Number) is attached.

[0071]The case where video information is recorded in the following procedures in Data Area 1004 of an information storage medium (Optical Disk 1001) now is considered.

[0072]1. Data Area 1004 in information storage medium (Optical Disk1001) From the inner sector number (LSN) a+1 To the continuation field (a<g) to g AVFile 1401 record section is secured.

[0073]2. AV File 1401 From the sector number (LSN) b+1 in a record section To the continuation field (b<c) to c VOB#1 The data of 1461 is recorded.

[0074]3. AV File 1401 From the sector number (LSN) d+1 in a record section To the continuation field (d<e) to e VOB#2 The data of 1462 is recorded.

[0075]It is AV File 1401 as a result of processing from above-mentioned 1. to 3. Inside, three non-record sections, "from e+1 up to g", remain with the sector number (LSN). ["from c+1 to d"] ["from a+1 to b"] Next, data size is big to this non-record section. When recording the video information of VOB #3, it is 4.AV File 1401. It doubles with the non-record section size in a record section. The data of VOB #3 is divided into plurality.

[0076]5. It was divided. It is from the sector number (LSN) a+1 about the data of the beginning of VOB #3. It records on the continuation field (a<b) to b.

[0077]6. It was divided. It is from the sector number (LSN) c+1 about the next data of VOB #3. It records on the continuation field (c<d) to d.

[0078]7. It was divided. It is from the sector number (LSN) f+1 about the data of the last of VOB #3. It records on the continuation field (f<g) to g.

[0079]-- As a result, AV File 1401 Inside, the non-record section 1460 "from e+1 to f" remains with the sector number (LSN).

[0080]The processing to say is needed. it was obtained as a result of processing from 1. to the above 7. AVFile 1401 -- inside -- each -- Physical recording position distribution of VOB is shown in drawing 4.

[0081]The above-mentioned explanation should show. AV File 1401 Fractional elimination of the inner data is carried out, or it is AV File 1401. If the additional recording of new data is repeated to an inner non-record section, VOB #3 It is one piece like the example of 1463, 1464, and 1465. VOB The necessity of carrying out distributed record produces data in two or more places.

[0082]thus, the same AV File 1401 -- every of each data by which distributed record

was carried out inside -- VOB -- each time -- the information which showed physical recording position distribution is Allocation Map Table 1105 shown in drawing 1 (f). Information content of Allocation Map Table1105 at the time of making data arrangement of drawing 4 into an example is shown in drawing 5. Allocation Map Table1105 -- the position distribution information 1621 on a non-record section -- each -- VOB -- each time -- it comprises the data-recording-positions distribution information 1622, 1623, and 1624.

[0083]each -- VOB -- the lump to which relation of the sector number which continues inside is secured is defined as "Extent." In the example of drawing 4 The data of VOB #3 is divided and recorded on three settlements. At the above-mentioned example, it is from the sector number (Logical Sector Number) a+1. Since it has relation of the sector number which even b follows, this field constitutes "Extent #gamma 1473." Jam The position distribution on which the data of VOB #3 is recorded is Extent #gamma. 1473, Extent #delta1474, and Extent #epsilon It will have three places of 1475.

[0084]Allocation Map Table1105 shown in drawing 5 An inner non-record section and each 1601, 1602, 1603, and 1604 Extent(s) are first recorded on the position distribution information about VOB. then, every -- the start addresses 1606, 1607, 1608, 1609, 1610, and 1611 for every Extent -- the -- The Extent sizes 1614, 1615, 1616, 1617, 1618, and 1619 are recorded. Start address It is expressed by the "difference number" from the heading sector number (Logical Sector Number) of AV File 1401. Thus, when it expresses by a difference number, and the whole contents of AV File 1401 are transplanted to another information storage medium, it is Allocation Map Table 1105. Inner change information becomes unnecessary and the portability of a file improves. As shown in drawing 5, Extent size is expressed with the sector number. Expressing with the final address of Extent is also possible instead of expressing Extent size like drawing 5.

[0085]The information which shows the physical address on an information storage medium (Optical Disk 1001) by a DVD-RAM disk standard is called a physical sector number (PSN: Physical Sector Number), The address of the whole treated with a file system A logical sector number (LSN: LogicalSector Number), Data Area 1004 of drawing 1 (a) Inside, the address defined on a file system was called the logical block number (LBN: Logical Block Number), and is distinguished. However, an explanation content will become complicated if the describing method is followed faithfully. Therefore, in drawing 4 and drawing 5, the ease of an understanding is thought as important and expression of a logical sector number (LSN: Logical Sector Number) explains.

[0086][5] Contents Playback Control Information of Playback Control Information 1021 1021 The contents are explained using drawing 6 and drawing 7. Playback ControlInformation 1021 Inside PGC (Program Chain) Control Information1103 has a data structure shown in drawing 6, and reproduction sequence is determined by PGC and Cell. PGC shows the unit which performs a series of reproduction which specified the reproduction sequence of Cell. Cell was shown in drawing 3 (f) -- as -- each -- VOB -- the reproducing section which specified inner regenerative data by the start address and the ending address is shown.

[0087]PGC Control Information 1103, Search Pointer of PGC Information (search pointer of PGC information) of 1052 or 1 or more PGC Information Management Information (PGC information management information) 1053, 1054 And it comprises PGC Information1055, 1056, and 1057.

[0088]The information (Number of PGC Information) which shows the number of PGC(s) is included in PGC Information Management Information 1052. Search Pointer of PGC Information 1053 and 1054 search easily by pointing at the head of each PGC

Information. PGC Information1055, 1056, and 1057 comprise PGCGeneral Information 1061 and one or more Cell Playback Information 1062, and 1063. The information (Number of Cell Playback Information) which shows the regeneration time of PGC and the number of Cell(s) is included in PGC General Information 1061.

[0089]It is specified by setting regenerative data to Cell like drawing 7 in the reproducing section from Cell-A to Cell-F, and PGC Information is defined in each PGC.

[0090]1. PGC#1 shows the example which comprises Cell which specified the continuous reproducing section, and the reproduction sequence serves as Cell-A -> Cell-B -> Cell-C.

[0091]2. PGC#2 shows the example which comprises Cell which specified the intermittent reproducing section, and the reproduction sequence serves as Cell-D -> Cell-E -> Cell-F.

[0092]3. PGC#3 is not concerned with a reproduction direction or duplication reproduction, but an example refreshable at intervals is shown, and the reproduction sequence serves as Cell-E -> Cell-A -> Cell-D -> Cell-B -> Cell-E.

[0093][6] Contents Video Title Set Information of Video Title Set Information 1106 1106 As shown in drawing 8, an inner data structure. - Video Title Set General Information 1751 -- Information about the general contents item of Video Title Set.

[0094]- Video Object Sequence Information 1752 -- the data structure of drawing 3 -- the inside of Video Title Set 1402 (= AVFile) -- all -- Serial turn is set up to VOB. this sequence was followed -- each -- The order information of VOB is described here.

[0095]- Part_of_Titles Information 1753 -- AV File 1401 The grouping of each Objects data recorded inside is carried out for every data which has relation data management and for the purpose of search, A video title name is set up for every group. The above-mentioned group (Part_of_Title) It comprises an aggregate of VOB. It is contained for every Part_of_Title of this. VOB Information is described here.

[0096]- Video Title Set Time Map Table 1754 -- It is classified into Video Objects 1012 and Audio Objects 1014 in Video Title Set 1402. About VOB. Every specified time interval according to above-mentioned Video Object Sequence VOBU position information. The account of ** has recorded.

[0097]Video Object Sequence Information 1752 -- an inner concrete data structure is included in introduction Video Title Set, as shown in the right-hand side of drawing 8 -- all -- VOB 1756 [several] is recorded. According to the order of a sequence (Video Object Sequence), it corresponds in order after that. VOB VOB_ID 1757, 1758 -- It is recorded.

[0098]Video Object Sequence. The sequence shown by Information 1752 For example, "order [of record of AV File 1401] (early order of recording time)" "record [on an information storage medium (Optical Disk) as shown in drawing 4] arrangement order""VOB. It can set up arbitrarily by the user and information storage playback equipment side, such as order [of size]." the inside of VTS(Video Title Set)1402 -- all -- By setting VOB in order sequentially, an image is recorded on one tape. VTR and a similar user interface can be provided. For example, - which looks for a rapid traverse (FF) of - tape, and a place to rewind and see by (FR) - which confirms the contents of record of the whole by rapid traverse (FF) of a tape A rapid traverse (FF) of a tape, The unnecessary place already recorded by rewinding (FR) can be looked for, and processing of carrying out overwrite of the new video information to the unnecessary place can be performed using Video Object Sequence Information 1752.

[0099]Video Object Sequence Information1752 indicated on the right-hand side of drawing 8 Information content is explained using drawing 9. In the state where the arrangement order on an information storage medium (Optical Disk) showed drawing 4

first VOB#1 - VOB#3 are recorded and the case where this record turn is made according to the order of 1. to 7. explained to "[4] Explanation of the contents of Allocation Map Table" is considered. The order arrangement of a sequence at the time of setting up a sequence order to these data "in order of the record to AV File 1401 (early order of recording time)" serves as drawing 9 (a3). It compares with drawing 4 and is Extent #alpha. From 1471 Extent #zeta It turns out that the arrangement order to 1470 has changed. " VOB_ID 1757 in Video Object Sequence of the beginning" of drawing 8 specifies "VOB #1 1461" of drawing 9 (a3), "2nd VOB_ID 1758 in Video Object Sequence" specifies "VOB #2 1462" of drawing 9 (a3).

[0100]Drawing 9 (b3) shows another example specified by Video Object Sequence Information 1752. VOB #A 1771 and VOB #B 1772 belong to VideoObjects 1012 (classified), VOB#C 1773, VOB #F1776, and VOB #G 1777 belong to Audio Objects 1014 (classified), and VOB #D 1774 and VOB #E 1775 belong to Picture Objects1013. It is such. It does not depend on the kind of VOB, but it is intermingled, and a sequence order can be specified. In drawing 9, it collects at the end. It belongs to Thumbnail Objects 1016. VOB (VOB #H 1778 and VOB #I 1779) is set up.

[0101][7] Explain below a recording form (recording format) when recording still picture information on the information storage medium (Optical Disk1001) shown in recording format drawing 1 (a) of still picture information (Picture Objects). Speech information added to still picture information or still picture information later (voice input of the explanation to each still picture information is carried out, and) The information which carries out additional recording by after recording is recorded on the place of Picture Objects 1013 of drawing 1 (d), or Audio Objects 1016. For example, it is the format which can record the still picture of two or more sheets continuously supposing the scene which records at once the still picture of two or more sheets photoed with the digital camera (digital camera) on an information storage medium (Optical Disk 1001). In order to enable record of the still picture of two or more sheets continuously, it is the format which the still picture of at least two sheets records following the adjoining place on an information storage medium (Optical Disk 1001).

[0102]The speech information added to a still picture or a still picture also thought as important format continuity and compatibility with video information (Video Objects1012), and has followed the data structure of drawing 3. it is a kind of the recording format (video information compression format) of video information MPEG1 -- or -- It mentioned above in MPEG 2. The condensed information for one video frame corresponding to the head position of GOP exists in the form of "I-Picture." as opposed to the inputted still picture MPEG1 -- or -- Using the compression technology of MPEG 2, it changes into I-Picture 1706, 1707, 1708, and 1709, and, it is shown in drawing 10 (a3) or drawing 10 (c3) -- as -- . V_PCK(video pack) 1661, and 1662, 1663, 1668, 1669, 1670, 1671, 1672, 1673 and 1674 It is stored inside and recorded on an information storage medium (Optical Disk1001). it mentioned above -- as -- a DVD-RAM disk -- each -- V_PCK (video pack) is that whose recording size is 2034 bytes and which is recorded for every sector (refer to drawing 3 (f)). [Although 1Sector size is 2048Bytes, since there is PackHeader for every 14Bytes, the recording quantity in 1Pack serves as 2034Bytes.]As for an insufficient portion, the straw-man (Dummy) information 1704 is recorded to the 2034-byte integral multiple of the I-Picture size corresponding to the still picture information of one sheet. each -- the I-Picture size 1808 in VOBU is shown in drawing 13 -- as -- Since it is recorded in the information on VOBU Map for Picture Objects (it mentions later for details), Where in V_PCK (video pack)1670 shows whether the straw-man (Dummy) information 1704 enters. Therefore, the contents of the straw-man (Dummy) information 1704 can be set up arbitrarily. For example, for example, a sequence end code etc. are recordable as specific information known only by

reproducing the portion altogether as contents of the straw-man (Dummy) information 1704 in addition to "0" and the method of setting to "1" altogether. Although arrangement of I-Picture was abbreviated to drawing 10 (b3) by (d3), it has the same structure as (a3) and (c3).

[0103]For example, after photoing a still picture with a digital camera, The information is made into I-Picture to add a comment in handwriting directly on the taken image (still picture). Apart from the recorded still picture, it is as a sub picture stream (SP_Stream). It records on SP_PCK(Sub-picture Pack) 1681, and 1683 and 1684. At the time of reproduction V_PCK Inner I-Picture still picture information SP_PCK Inner sub picture (sub video image) information is displayed in piles.

[0104]Speech information which carried out voice input of the comment to each still picture, or the explanatory note A_PCK(Audio Pack) 1691-1702 It is recorded inside.

[0105]It is such. V_PCK [The information 1691-1702 is collected for every one still picture which is related, respectively,] The information 1661-1674 and SP_PCK The information 1681-1684 and A_PCK It is collected by 1641-1650 units of VOBU(s) (Video Object for Picture Objects). Therefore, VOBU which differ one still picture at a time consists of formats shown in drawing 10. example shown in drawing 10 VOBU -- inside -- certainly -- As opposed to A_PCK V_PCK and SP_PCK are made to precede. The result VOBU Each pack is made to separate inside and management of each information in a pack is made easy. However, it is Video Objects 1012, for example, without adhering to the above-mentioned restriction in this invention example. Like [of an inner recording format] It is also allowed to intermingle the turn of A_PCK, V_PCK, and SP_PCK and to be arranged. If it says, it has the still picture information recorded in the form of I-Picture. It is altogether the same if attached to V_PCK 1664. VOBU 1642 Although there is the necessity of being arranged inside, A part of speech information related to VOBU 1642 was recorded. A_PCK (1694) is the following VOBU 1643. It is also allowed to be arranged inside. So that it may mention later in the place of explanation of drawing 13, VOBU Map for Picture Objects 1738 Speech information currently recorded inside The information on E_PTM(Presentation terminating time) 1814 is used. It is because the continuous speech information is separable corresponding to each still picture. Two or more still picture information forms one VOB from VOBU of 1 plurality with the format structure shown in drawing 10 as a format recorded continuously.

[0106]2) One VOB has only one VOBU and the grouping of the VOB on which the still picture per sheet was recorded, respectively is carried out. VTT (Video Title) is constituted.

[0107]The method of two kinds of ** was permitted and both mixture record is accepted.

[0108]Drawing 10 (b1) - (d3) the former format structure are shown, and drawing 10 (a) shows the latter format structure. As for the former format structure, drawing 10 (b) shows basic structure, and, as for drawing 10 (c), the structure which does not include speech information (A_PCK), and drawing 10 (a) show the structure which does not contain the original still picture (V_PCK) as a special example. For example, it does not include speech information, after recording at once two or more still picture information photoed with the digital camera on an information storage medium (Optical Disk 1001), An inputted memorandum (additional recording as SP_PCK) may be carried out about each still picture, looking at two or more recorded still picture information, or voice input (additional recording as A_PCK) may be carried out. In this case, only additional information (a memo and phonetic form) is collected and the original still picture information is recorded. VOB is another. VOB is formed and edit and record can be performed more efficient [it / to record on an information storage medium (OpticalDisk

1001)]. It is another. The original still picture information is recorded for the direction recorded as VOB. VOB It is for there to be no necessity of changing the contents. Thus, only the additional information (a memo and phonetic form) aiming at the edit to still picture information was collected. VOB 1634 An inner recording format serves as a structure (V_PCK is not included data of only A_PCK and SP_PCK) similar to drawing 10 (d).

[0109]When two or more still picture information adopts the latter format as a format recorded continuously, as it is shown in drawing 3 (c), the grouping of two or more VOB(s) is carried out, and each is differed. The group of VTT(Video Title)1407 and 1408 is made to belong.

[0110]The still picture of at least two sheets can record the recording format shown in drawing 10 following the adjoining place on an information storage medium (Optical Disk 1001), Since it is the form which can generally record the still picture of two or more sheets continuously, For example, when recording at once the still picture of two or more sheets photoed with the digital camera (digital camera) on an information storage medium (Optical Disk 1001), it has the big effect and feature referred to as recordable at high speed.

[0111]It is VOB in addition to it. The recording format which can record two or more still pictures inside has the big effect that it explains below.

[0112]The recording form of the still picture of two or more sheets conventionally photoed with the digital camera (digital camera) is divided and recorded on a data file different [one sheet one sheet still picture]. If division recording of each still picture information is carried out to a separate file, the grouping information between the order information of photography or the similar still picture information between each still picture information does not exist. Compared with it, a negative film (or positive film created if needed) is certainly attached with a photographic film. Therefore, a still picture [following / to specify a specific still picture by extra copy etc. / the order of photography on a negative film] to look for can be searched. The information on Video Object for Picture Objects 1632 which record and is on an information storage medium (Optical Disk 1001) in the information storage playback equipment for video information record (VCR) shown in drawing 19 is read, it is shown in drawing 11 -- as -- a positive film -- like -- each -- It can display on the arrangement order of VOBU 1642-1644 on a screen. For example, the still picture at the left end of drawing 11 expresses the information on VOBU1642, and the central still picture shows the information on VOBU1643. Being able to move the still picture of drawing 11 to right and left on a screen, a user specifies a still picture (or I would like to carry out a hard copy) to edit. Unlike Video Objects 1012, still picture information specifies each still picture using a display like drawing 11. (In Video Objects1012, the video information range to edit by display time is specified.)

[8] Video Object about still picture information. Video Object Information 1107 shown in the data structure diagram 1 in Information (f) is divided into the management information portion about the management information portion about general video information, and still picture information. The data structure in the management information portion about the latter still picture information is having structure shown in drawing 12. Separate Video Object for. Picture Objects (VOB.) Each still picture information by which the grouping was carried out to for Picture Objects is Video Object Informationfor Picture Objects 1731-1733. It is recorded inside. Information content shown in the drawing 12 right-hand side. When it explains briefly, * VOB General. Information for Picture Objects1736 -- - for example, -- Cell Playback Information 1108 -- specific inside It set uniquely to every VOB so that VOB could be specified. ID information.

[0113]- VOB type information --. [whether it belongs to the information on (a) - (d) throat of drawing 10, and] And video information (Video Objects.) Time which recorded VOB or VOB about any of 1012 / still picture information (Picture Objects 1013) / speech information (Audio Objects 1014) on the information storage medium (Optical Disk 1001). It is by **.

[0114]* VOB Attribute Information for Picture Objects1737 -- Attribution information of still picture information, such as resolution of - still picture information They are the number of the attribution information and the sub video image (Sub-picture) information on - speech information, a recording form, etc.

[0115]* VOBUMap for Picture Objects 1738 -- VOB It is the information about all the still pictures contained inside.

[0116]Above information * is recorded. Video Object Information. forPicture Objects Management Information 1721 - it is contained in this AV file It is contained in the number of VOBfor Picture Object, and this AV file. . The general information about VOB, etc. are recorded. Video Object shown in drawing 1 (f). Information 1107 It is each Video Object Information for Picture Objects 1731-1733 to where [inner]. The address information of whether information is recorded Search. It is recorded on Pointer of Video Object Information for Picture Objects 1726-1728.

[0117][9] It is related with still picture information. The data structure diagram 13 in VOBU Map is used. VOBU Map for Picture Objects1738 An inner data structure is explained. Be shown in the drawing 13 upper left. It corresponds to the beginning of VOBU Map for Picture Objects 1738. VOB The number of sheets (VOBU number) 1801 of the still picture contained inside is shown. After that VOB According to the order arranged inside, the information about each still picture (contents of VOBU) is described.

[0118]The information shown in the drawing 13 right-hand side as information about each still picture (contents of VOBU) is recorded. It has the still picture information of one sheet also included speech information. The information on VOBU 1411 is divided and recorded on two or more sector (Sector) 1431-1434 like drawing 3 (f). The data size 1806 for this still picture information (VOBU) of one sheet is expressed with the number of sector (Sector) by which division recording was carried out.

[0119]It is inside like drawing 10 (a) and drawing 10 (b). It has A_PCK (Audio Pack). To VOBU, the display time 1807 of the still picture of one sheet is. The regeneration time of the speech information in VOBU is meant, Like [of drawing 10 (c)] It does not have A_PCK (Audio Pack). The stillness display period of the still picture is expressed to VOBU.

[0120]The following information * is recorded as information about the still picture information in VOBU on which the still picture information of one sheet is recorded itself.

[0121]* correspond VOBU -- head inside V_PCK address 1808 -- if drawing 10 is taken for an example -- each -- It is located in the head of VOBU. The address information of V_PCK 1661, 1664, 1665, 1666, 1667, 1668, 1671, and 1674 etc. is recorded. A still picture to see is contained. ID and VOB of VOB If an inner still picture number (number of VOBU) is specified, an optical head (202 of drawing 20) corresponds using this address information. Direct access is carried out to the head V_PCK address of VOBU.

[0122]LSN (Logical Sector Number) which shows the direct position on an information storage medium (Optical Disk 1001) as shown in drawing 4 as address information is generally shown. However, the same according to the order arrangement of a sequence of data, as shown in drawing 9 (a3) not only as the above-mentioned method of presentation but as other application examples It may display with the sector number

(relative address) counted in order of the sequence from the start address of VOB.

[0123]* It corresponds. VOBU Inside I-Picture size 1809 -- As drawing 10 (a3) and drawing 10 (c3) explained, inside of I-Picture 1706 and the data size of 1707, As for the insufficient portion, the straw-man (Dummy) information 1704 is recorded to the integral multiple of 2034Bytes which is pack sizes. Therefore, beforehand Since the place where the straw-man (Dummy) information 1704 is recorded is also known if I-Picture size is known, it can go into the access operation to the next place, without reproducing this portion at the time of reproduction, and fast reproduction can be realized.

[0124]* Still picture (V_PCK & SP_PCK) S_PTM (Presentationstarting time) 1810 -- This means the information which shows the display timing of the still picture at the time of reproduction, and the sub video image (Sub-picture) added to it. At this invention, it is at the time of reproduction. The still picture recorded in V_PCK and the sub video image (Sub-picture) added to it are displayed simultaneously. The same VOBU It is used for setting out of the display timing between the speech information inside.

[0125]* First_SCR(First System Crock) 1811 of a still picture (V_PCK) -- this, It is VOBU in order to record on an information storage medium (Optical Disk 1001). The value of a system clock when V_PCK of the inner beginning is created is meant, and this information is used when performing seamless (****) reproduction.

[0126]Next, the following information is recorded as information about the speech information in VOBU on which the still picture information of one sheet is recorded.

[0127]* VOBU -- inner head A_PCK address 1812 -- if this takes drawing 10 for an example -- each -- It is located in the head of VOBU. The address information of A_PCK$_{1691, 1693, 1694, 1695, 1696, 1699}$, 1702, etc., etc. is recorded. a still picture to see is contained VOB ID -- the -- VOB -- if an inner still picture number (number of VOBU) is specified, an optical head (202 of drawing 20) corresponds using this address information Direct access is carried out to the head A_PCK address of VOBU.

[0128]As shown in drawing 14 (c), at this invention, it is one piece. VOB It is another in inner speech information (A_PCK information). It can display combining the still picture information belonging to VOB. It follows. VOB This information is used when reproducing only inner speech information selectively.

[0129]LSN (Logical Sector Number) which shows the direct position on an information storage medium (Optical Disk 1001) as shown in drawing 4 as address information is generally shown. However, the same according to the order arrangement of a sequence of data, as shown in drawing 9 (a3) not only as the above-mentioned method of presentation but as other application examples It may display with the sector number (relative address) counted in order of the sequence from the start address of VOB.

[0130]* Speech information (A_PCK) S_PTM(Presentation starting time) 1813 -- This means the information which shows the output timing of the speech information at the time of reproduction. In many cases, this value is a still picture (V_PCK & SP_PCK). Although it is in agreement with S_PTM 1810, a value is shifted and set up to output the sound after specific time (for example, 0.5 second) progress after displaying a still picture screen purposely. Thus, this information is used for the timing control between a still picture display and a speech information output.

[0131]* Speech information (A_PCK) E_PTM(Presentation terminating time) 1814 -- This means the information which shows the timing at the time of the end of an output of the speech information at the time of reproduction, and this information is used for the timing control between a still picture display and a speech information output. In many cases, this value is in agreement with S_PTM 1810 of the still picture (V_PCK & SP_PCK) displayed on the next, but it begins purposely after the end of voice response,

and specific time (for example, 0.5 second) progress, and a value can be shifted and set up to display the still picture information displayed on the next.

[0132]* First_SCR(First System Crock) 1815 of speech information (A_PCK) -- this, It is VOBU in order to record on an information storage medium (Optical Disk 1001). The value of a system clock when A_PCK of the inner beginning is created is meant, and this information is used when performing seamless (****) reproduction.

[0133]* First_SCR(First System Crock) 1815 of speech information (A_PCK) -- this, In order to record on an information storage medium (Optical Disk 1001), the value of a system clock when A_PCK of the last in VOBU is created is meant, and this information is used when performing seamless (****) reproduction.

[0134]Thus, it is related with still picture information and speech information. PTM Information SCR There is the feature referred to as being able to use the video information belonging to Video Objects 1012 for a part of still picture information by recording information. That is, without processing it at all to the video information belonging to Video Objects 1012 itself, as shown below, new Video Object Information for Picture Objects for still pictures is defined. The case where the still picture which changes the still picture displayed every 2 seconds as opposed to the conventional image method (Video Objects 1012) is defined is explained. One piece shown in drawing 3 (e) since the time required of 1GOP is generally about 0.5 second in video information The length of VOBU has around [much] 0.5 second. It follows. 2 second / 0.5 second = they are four pieces from four. It is considered to every VOBU that top I-Picture is a still picture. VOB Head inside V_PCK Address 1808 VOB Inside Set up the information on the I-Picture size 1809, and. The numerical value on the right-hand side of drawing 18 is set up similarly.

[0135]As a result, as shown in drawing 14, it differs. By displaying combining the still picture information and speech information belonging to VOB, It becomes possible to change into a still picture only the scene which carries out voice response only of the audio part within the video information belonging to Video Objects 1012 at the time of a still picture display or with which the user within the video information belonging to Video Objects 1012 is pleased, and to display it.

[0136][10] As shown in drawing 11 as the method of presentation of the still picture information of two or more sheets recorded on the method-of-presentation information storage medium (Optical Disk 1001) of the still picture of two or more sheets. The still picture displayed as the method (- however, the still picture put in order and displayed moves or interchanges) of displaying two or more sheets side by side at once at once has a method of changing the still picture which it makes into one sheet at a time, and is displayed for every specific time. In any case, a data structure top should be shown in drawing 6 and drawing 7. Cell and PGC Information is used and a user can choose the method of presentation now with the information storage playback equipment for video information record (VCR) shown in drawing 19.

[0137]Like Video Object Information 1107, The inside of Cell Playback Information 1108 shown in drawing 1 (f) is divided into Cell Playback Information about Cell Playback Information about video information, and still picture information. In Cell Playback Information about still picture information, it has structure which can reproduce, combine and display a still picture and speech information from a different place as shown in drawing 14. That is, be shown in drawing 14 (c). Cell It uses for an inner display. V_PCK 1852 and 1854 SP_PCK 1848 VOB #A1821 The inner still pictures 1832 and 1834 are specified, It is the same. Speech information outputted from Cell It differs in VOB #A 1821. VOB #B 1822 It has the structure where the inner speech information 1845 and 1846 can be specified.

[0138]This structure is postrecording setting out to a still picture with a convenient

structure. For example, if the still picture information photoed with the digital camera without a voice input function is recorded on an information storage medium (Optical Disk 1001) as it is, the record result has structure which does not contain A_PCK (Audio Pack) as shown in drawing 10 (c3). The information is reproduced, and the case where description and a comment are added to every sheet by methods, such as "voice input with a microphone", "overwrite of the mark by handwriting", and "an addition of the text information by key in", is considered, carrying out a screen display like drawing 11. In this case, it is drawing 10 (c3) about a recording format. Like [of the structure which does not contain A_PCK to drawing 10 (b3)] If you are going to make it change to the structure containing A_PCK, makeup processing of the record to up to an information storage medium (Optical Disk 1001) will occur, Processing becomes troublesome and processing time will start substantially. It is shown in drawing 10 (c3) to it. Without modifying the data which does not contain A_PCK (Audio Pack), An exception like drawing 10 (d) only for additional information If VOB 1634 is used and it records on an information storage medium (Optical Disk 1001), after receiving a still picture, it can carry out in that the adding processing of information is very easy, and a short time. the time of a display -- drawing 14 -- like -- VOB 1633 A display and the output of are done combining VOB 1634.

[0139]Expression of drawing 14 is attained. The data structure in Cell Playback Information for Picture Objects is shown in drawing 15. Introduction Cell It is an original identifier. ID information 1873 is indicated, Next, it is indicated. It is related with 1 video information (Video Objects 1012) in the kind information 1880 of Cell. Cell in information. It is related with a still picture (Picture Objects 1013). Cell in information. It is related only with speech information (Audio Objects 1014). Identification information and 2VOB of Cell information Two or more still pictures were recorded inside. (The structure of drawing 15 corresponds) in the Cell information over VOB (drawing 10 (b) format of - (d)), The still picture of only one sheet was recorded in VOB. VOB (format of drawing 10 (a)) is received. Cell Information or the identification information to which the structure of drawing 16 is related for (corresponding) is expressed.

[0140]Thus, the still picture was recorded. Difference in the recording format of VOB It absorbs on the level of CellPlayback Information for Picture Objects, The still picture was recorded on the level of PGC shown in drawing 7. The big feature is in the place whose repeat display is made possible by the same sequence [be / no difference in the recording format of VOB and distinction with video information].

[0141]Video Pack is recorded. VOB At the example of drawing 14, it is as ID information. VOB#A 1821 is specified. It is Cell when you want to display from the 2nd still picture of VOB#A 1821. As the still picture specification 1875 displayed on the beginning inside VOB#A 1821 The still picture number 2 is specified. It doubles with the example of drawing 14. Cell In the still picture specification 1876 displayed on the last inside, it is VOB#A 1821. The still picture number h is specified. Thus, in Cell Playback Information for Picture Objects, the big feature is in the place which specifies the "still picture" itself about a designated object. Although the "still picture number" is specified as a specification method of a still picture in the example of drawing 15, Not only it but "specification of unit (for example, VOBU) itself which records and has still picture" "start-address [which records and has a still picture] specification""VOB Specifying by sequence turn [inside]" etc. is also possible. With drawing 15 Although the still picture of the beginning in Cell and the last is specified, it is a substitute of the above-mentioned method of presentation n. Cell Still picture displayed on the inner beginning Cell There is also the method of displaying the total number of still pictures displayed inside.

[0142]Audio Pack is recorded similarly. VOB ID Information 1877 (VOB#B 1822 is specified in the example of drawing 14), Cell The still picture number 1878 (the still picture number j is specified in the example of drawing 14) which shows the archive destination of the speech information (A_PCK) outputted to the beginning inside is indicated. With drawing 15 The still picture number information which shows the archive destination of the speech information (A_PCK) outputted to the last within Cell is not indicated. however, Cell -- still picture number 1875 displayed on the inner beginning Cell -- since the total still picture number of sheets displayed within the same Cell from the still picture number 1876 displayed on the inner last is known, it is written needlessness. When specifying speech information to all the still pictures by drawing 14 (c), it is with S_PTM 1813 of the speech information of drawing 13. Although the display time per still picture of E_PTM 1814 to one sheet is known, In not specifying speech information to specific VOBU, it sets up the display time of a still picture using the information on the stillness display time 1879 per still picture.
[0143][11] When the still picture of only one sheet is recorded in 1VOB(Video Object for Picture Objects)1631 like a grouping and method-of-presentation drawing 10 (a) in case the still picture of only one sheet is recorded on 1VOB, Two or more still pictures The grouping of the VOB is collected and carried out and it is dealt with as Part_of_Title. Video Title Set Information 1106 which showed drawing 1 (f) this grouping information Part_of_Titles Information 1753 shown in inner drawing 8 It is recorded inside. Part_of_Titles about the still picture shown in drawing 17. Information. 1753 An inner data structure and inside of it VOB. Map for Picture Objects. 1899 An inner data structure (146 figures) is shown in the data structure and drawing 13 in Video Object Information shown in drawing 12. It has a data structure in VOBU Map for Picture Objects, and an almost similar structure.
[0144]The Cell Playback Information for Picture Objects structure (drawing 16) corresponding to this also has the same structure as drawing 15.
[0145]Next, the structure of the information storage playback equipment for video information record (VCR) is explained.
[0146]Drawing 19 is a block configuration explanatory view in the information storage playback equipment for video information record (VCR). In this specification, numerals are attached and explained on the convenience of the space of a drawing, and in a block.
[0147]The device main frame of the VCR shown in drawing 19, The disk drive part which says roughly, rotates the information storage medium (optical disc) 201, and performs the recording and playback of video information to this information storage medium (optical disc) 201, It comprises the encoder part 1550 which constitutes the recording side, the decoder section 1560 which constitutes the playback side, and the system control part (MPU part) 1530 which builds ROM and RAM (semiconductor memory) in an inside, and controls operation of a device main frame.
[0148]The encoder part 1550 is provided with the following.
ADC(analog-to-digital converter) 1552.
Video encoder (V encoder) 1553.
Audio encoder (A encoder) 1554.
The sub video image encoder (SP encoder) 1555, the formatter 1556, and the buffer memory 1557.

[0149]The external analog video signal + external analog audio signal from the AV input part 1542 or the analog TV signal + analog voice signal from the TV tuner 1544 is inputted into ADC1552. This ADC1552 digitizes the inputted analog video signal, for example with the sampling frequency of 13.5 MHz, and the quantifying bit number of 8 bits. (That is, the brightness component Y, the color difference component Cr (or Y-R),

and each color difference component Cb (or Y-B) are quantized at 8 bits.) Similarly, ADC1552 digitizes the inputted analog audio signal, for example with the sampling frequency of 48 kHz, and the quantifying bit number of 16 bits.

[0150]When an analog video signal and a digital audio signal are inputted into ADC1552, ADC1552 carries out the through pass of the digital audio signal. (The contents of the digital audio signal are good in limping gaits, such as processing which reduces only the jitter which does not change but accompanies a digital signal, or processing which changes a sampling rate and a quantifying bit number).

[0151]On the other hand, when a digital video signal and a digital audio signal are inputted into ADC1552, ADC1552 carries out the through pass of a digital video signal and the digital audio signal (good [without changing the contents also to the digital signal of these] in limping gaits, such as jitter reduction processing and sampling rate change processing).

[0152]Information inputting is directly carried out to the V encoder 1553, without going via ADC1552, when the still picture information by the digital camera 1543 is inputted in addition to the above-mentioned video signal input.

[0153]The digital video signal ingredient from ADC1552 is sent to the formatter 1556 via the video encoder (V encoder) 1553. The digital audio signal ingredient from ADC1552 is sent to the formatter 1556 via the audio encoder (A encoder) 1554. Or the still picture signal by which the direct entry was carried out to the V encoder 1553 is sent to the formatter 1556 from the V encoder 1553.

[0154]The V encoder 1553 has the function to change the inputted digital video signal into the digital signal compressed with the Variable Bit Rate based on MPEG 2 or MPEG1 standard.

[0155]Still picture information is recorded on the digital camera 1543 in format forms, such as bit map format and JPEG form. By this invention, a still picture is recorded on the information storage medium (optical disc) 201 according to I picture format of MPEG 2 to it. With therefore, this invention Format conversion functions, such as "bit map -> MPEG 2" and "JPEG-> MPEG 2", are also given to the V encoder 1553.

[0156]The A encoder 1554 has the function to change the inputted digital audio signal into the digital signal (or digital signal of linear PCM) compressed with the fixed bit rate based on MPEG or an AC-3 standard.

[0157]When a video signal is inputted from the AV input part 1542 (for example, signal from the DVD video playr with an independent output terminal of a sub video signal), Or when the video signal of such a data configuration is broadcast and it is received by the TV tuner 1544, the sub video signal ingredient (sub video image pack) in a video signal is inputted into the sub video image encoder (SP encoder) 1555. The sub picture data inputted into the SP encoder 1555 is arranged by predetermined signal aspect, and is sent to the formatter 1556.

[0158]The formatter 1556, using the buffer memory 1557 as a work area. Predetermined signal processing is performed to a video signal, an audio signal, a sub video signal, etc. which were inputted, and the record data corresponding to a predetermined format (file structure) is outputted to the data processor 1536.

[0159]In the case of digital broadcasting, a video signal is transmitted in TS (transport stream) form of MPEG 2. When a video signal is generally recorded on the information storage medium (optical disc) 201 in the format of MPEG 2, PS (program stream) form is used. Therefore, when digital broadcasting is received, an input signal is directly sent to the formatter 1556 from the TV tuner 1544, and "TS -> PS conversion" is performed within the formatter 1556.

[0160]Here, the standard contents of encoding processing for creating the above-mentioned record data are explained briefly. That is, if encoding processing is

started in the encoder part 1550 of drawing 19, a required parameter will be set in encoding of video (main video image) data and audio information. Next, the PURIEN code of the main video image data is carried out using the set parameter, and distribution of the optimal code amount for the set-up average transfer rate (recording rate) is calculated. In this way, encoding of a main video image is executed based on the code amount distribution obtained in PURIEN code. At this time, encoding of audio information is also executed simultaneously.

[0161]As a result of a PURIEN code, when a data compression amount is insufficient (when the video program of hope has not been settled in the information storage medium (optical disc) 201 which it is going to record), If it can have an opportunity to carry out a PURIEN code again (if the sauce of recording is sauce in which repeated regeneration, such as videotape or a video disk, is possible), Partial re-encoding of main video image data is executed, and the main video image data of the re-encoded portion is replaced by the main-video-image-data portion which carried out the PURIEN code before it. Main video image data and audio information are encoded by such a series of processings, and the value of the average bit rate required for record is substantially reduced by them.

[0162]A parameter required to encode sub picture data similarly is set, and the encoded sub picture data is created.

[0163]The main video image data, audio information, and sub picture data which were encoded as mentioned above are put together, and it is changed into the data structure of a desired video object.

[0164]Namely, the cell as the minimum unit of main video image data (video data) is set up, Next, the attribute etc. of the composition of the cell which constitutes a program chain, a main video image, a sub video image, and an audio are set up (a part of attribution information of these.). The information for which the information acquired when encoding each data is used concerning [management information including various information] a cell is recorded in a management information recording region (Control Information 1011).

[0165]The main video image data, audio information, and sub picture data which were encoded are subdivided by the pack of certain size (2048 bytes). A straw-man pack is suitably inserted in these packs. In packs other than a straw-man pack, time stamps, such as PTS (presentation time stamp) and DTS (decoding time stamp), are described suitably. About PTS of a sub video image, the time arbitrarily delayed from PTS of the main video image data of the same regeneration time belt or audio information can be described.

[0166]And in order of the time code of each data, each data cell is arranged per VOBU and VOB which comprises two or more cells is constituted so that it may be refreshable.

[0167]Since the contents of the above-mentioned cell, a program chain, a management table, the time stamp, etc. had been decided since the start when carrying out the digital copy of the video information from the information storage playback equipment for video information record (VCR), it is not necessary to create these anew.

[0168]The disk drive part which performs reading and writing (recording and/or playback) of information to the information storage medium (optical disc) 201 is provided with the following.

Disk changer part 1500.

Information storage regenerating section 101.

Temporary storage part 1534.

The data processor 1536 and the system time counter (or a system time clock; STC) 1538.

[0169]The temporary storage part 1534 carries out buffer IRINGU of the part for the constant rate of the data (data outputted from the encoder part 1550) written in the information storage medium (optical disc) 201 via the information storage regenerating section 101, or, It is used for carrying out buffer IRINGU of the part for the constant rate of the data (data inputted into the decoder section 1560) played from the information storage medium (optical disc) 201 via the information storage regenerating section 101.

[0170]For example, when the temporary storage part 1534 comprises semiconductor memory (DRAM) which is 4 M bytes, the record for about 8 seconds or buffering of regenerative data is possible at the recording rate of an average of 4 Mbps(es). When the temporary storage part 1534 comprises an EEPROM (flash memory) which is 16 M bytes, the record for about 30 seconds or buffering of regenerative data is possible at the recording rate of an average of 4 Mbps(es). When the temporary storage part 1534 comprises micro HDD (hard disk) which is 100 M bytes, the record for 3 minutes or more or buffering of regenerative data is attained with the recording rate of an average of 4 Mbps(es).

[0171]The temporary storage part 1534 can be used for storing temporarily recording information until it is exchanged for a disk with the new information storage medium (optical disc) 201 when the information storage medium (optical disc) 201 has been exhausted in the middle of recording.

[0172]The temporary storage part 1534 can be used also for storing temporarily the data usually read by the excess from the drive in fixed time when a high-speed-recording-reproduction part 2X or more is adopted as the information storage regenerating section 101. If the read data at the time of reproduction is buffered in the temporary storage part 1534, Even when the optical head 202 of drawing 20 starts a reading error with an oscillating shock etc., a reproduced image can be prevented from breaking off by changing and using the regenerative data buffered by the temporary storage part 1534.

[0173]Although not illustrated in drawing 19, if the external card slot is provided in the information storage playback equipment for video information record (VCR), the above-mentioned EEPROM can carry out an option as an IC card of an option. If the external drive slot or the SCSI interface is provided in the information storage playback equipment for video information record (record playback video recorder), the option also of the above-mentioned HDD can be carried out as an extended drive of an option.

[0174]In the gestalt which forms a personal computer into a DVD VCR by software, a part of free space of a personal computer's own hard disk drive or a part of main memory can be used as the temporary storage part 1534 of drawing 19.

[0175]The data processor 1536 of drawing 19 is a system control part (MPU part). [ROM/RAM built-in] After taking out the video information signal played according to control of 1530 from the supply and the information storage regenerating section 101 to the information storage regenerating section 101 of the video information signal for the recording from the - encoder part 1550, Rewriting processing [of the management information (Control Information 1011) recorded on the transmission processing and the information storage medium 201 to other portions (optical disc)] - Video information and management information (Control.) which are the data recorded on the information storage medium (optical disc) 201 Partial deletion of Information 1011, etc. are performed.

[0176]The system control part 1530 contains ROM which is the IC memory with which MPU (or CPU), a control program, etc. were written in, and RAM which is the IC memories which provide a work area required for program execution.

[0177]The contents of which the user of the information storage playback equipment for

video information record (record playback video recorder) should be notified among the executed results of the system control part 1530 are displayed on the VCR indicator 1548.

[0178]Based on the temporal data from STC1538, the timing by which the system control part (MPU part) 1530 controls the disk changer part 1500, the information storage regenerating section 101, the data processor 1536, the encoder part 1550, and/or the decoder section 1560, It can perform (although operation of recording and playback is usually performed synchronizing with the time clock from STC1538, the other processing may be performed to the timing which became independent of STC1538).

[0179]The separator 1562 which the decoder section 1560 separates each pack from video information with the pack structure currently recorded on the information storage medium (optical disc) 201, and is taken out, The memory 1563 used at the time of other pack separation and signal-processing execution, the video decoder (V decoder) 1564 which decodes the main video image data (the contents of the video pack) separated with the separator 1562, the sub picture data separated with the separator 1562. (The contents of the sub video image (sub picture) pack). The sub video decoder to decode. (SP decoder) The audio information (the contents of the audio pack) separated with 1565 and the separator 1562 from the audio decoder (A decoder) 1568 and the V decoder 1564 to the video data to decode the sub picture data from the SP decoder 1565. The video digital-analog converter (V-DAC) 1567 which changes into an analog video signal the digital video output from the video processor 1566 and the video processor 1566 which compounds suitably and outputs a menu, a highlight button, and a title and other sub video images to a main video image in piles, It has the audio digital-analog converter (A-DAC) 1567 which changes the digital audio output from the A decoder 1568 into an analog audio signal.

[0180]The analog video signal (video information signal of an analog state) from V-DAC1567, and the analog audio signal from A-DAC67, The external component (multi-channel stereo unit + monitor TV of two channels - six channels or projector) which is not illustrated is supplied via the AV outputting part 1546.

[0181]The OSD (On Screen Display) data outputted from the system control part (MPU part) 1530 is inputted into the separator 1562 of the decoder section 1560, passes the V decoder 1564 and is inputted into the video (decoding in particular is not carried out) processor 1566. Then, a main video image is overlapped on these OSD data, and it is supplied to external monitor TV connected to the AV outputting part 1546. Then, a warning sentence is displayed with a main video image.

[0182]The internal structure of the information storage regenerating section (physical system block) 101 is explained using drawing 20.

[0183](22A) using condensing spot for the prescribed position on the - information storage medium (optical disc) 201 in the basic function information storage regenerating section of the functional description (22A-1) information storage regenerating section of an information storage regenerating section -- record of new information -- or -- rewriting (elimination of information is also included) -- carry out.

[0184]- Play the information already recorded using condensing spot from the prescribed position on the information storage medium (optical disc) 201. ** is processed.

[0185](22A-2) Make condensing spot trace along the track (not shown) on the - information storage medium 201 by an information storage regenerating section as a means to attain the basic function of the basic function achievement means above of an information storage regenerating section (flattery).

[0186]- Change the light volume of the condensing spot with which the information storage medium 201 is irradiated, and change record / reproduction / elimination of

information.

[0187]- In order to record the record signal d given from the outside by high density and a low error rate, change into the optimal signal. ** is performed.

[0188](22B) The signal detection optical head 202 by the structure of a working part, of operation (22B-1) optical head 202 basic structure of a detection section, and the signal detection circuit (22B-1-1) optical head 202 is illustrated fundamentally. Although there is nothing, it comprises the semiconductor laser element, photodetector, and object lens which are light sources.

[0189]The laser beam which emitted light from the semiconductor laser element is condensed on the information storage medium (optical disc) 201 with an object lens. Photoelectric conversion of the laser beam reflected with the light reflection film or light reflex nature record film of the information storage medium (optical disc) 201 is carried out by a photodetector.

[0190]The detection current acquired with the photodetector is current by the amplifier 213. - Voltage conversion is carried out and it becomes a detecting signal. This detecting signal is processed in the focal track error detector circuit 217 or the binarization circuit 212. Generally the photodetector was divided into two or more photodetection fields, and light volume change irradiated by each photodetection field is detected separately. The sum and a difference are calculated to each detecting signal of this in the focal track error detector circuit 217, and a focal gap and a track gap are detected. The reflected-light-quantity change from the light reflection film or light reflex nature record film of the information storage medium (optical disc) 201 is detected, and the signal on the information storage medium 201 is played.

[0191](22B-1-2) The amount of focal gap detecting method focus gaps as a method of detecting optically. * Astigmatic method : how to detect the shape change of the laser beam which arranges the optical element which generates astigmatism although not illustrated to the detecting optical path of a laser beam reflected with the light reflection film or light reflex nature record film of the information storage medium (optical disc) 201, and is irradiated on a photodetector. The photodetection field is quadrisected in the shape of a diagonal line. To the detecting signal acquired from each detection area, the difference of diagonal Hotan is taken in the focal track error detector circuit 217, and a focus-error-detection signal is acquired. Or the * knife-edge method: How to arrange knife edge which shades a part asymmetrically to the laser beam reflected with the information storage medium 201. A photodetection field is divided into two, takes the difference between the detecting signals acquired from each detection area, and acquires a focus-error-detection signal. It is used whether you are ****** et al. in many cases.

[0192](22B-1-3) The track gap detecting method information storage medium (optical disc) 201 has a track of spiral shape or concentric circle shape, and information is recorded on a track. Condensing spot is made to trace along this track, and reproduction of information, or record/elimination is performed. In order to be stabilized and to make condensing spot trace along a track, it is necessary to detect a relative location gap of a track and condensing spot optically. The intensity distribution change on the photodetector of the laser beam generally reflected as a track gap detecting method with the light reflection film or light reflex nature record film of the *DPD (Differential Phase Detection) method:information storage medium (optical disc) 201 is detected. The photodetection field is quadrisected in the shape of a diagonal line. To the detecting signal acquired from each detection area, the difference of diagonal Hotan is taken in the focal track error detector circuit 217, and a track error detecting signal is acquired. Or the *Push-Pull method: Detect the intensity distribution change on the photodetector of the laser beam reflected with the information storage medium 201. A photodetection field is divided into two, takes the difference between the detecting signals acquired

from each detection area, and acquires a track error detecting signal.

[0193]* The Twin-Spot method : arrange a diffraction element etc. in the light transmission system between a semiconductor laser element and the information storage medium 201, carry out wavefront splitting of the light to plurality, and detect reflected-light-quantity change of the primary [**] diffracted light with which it irradiates on the information storage medium 201. The photodetection field which detects the reflected light quantity of the primary [+] diffracted light and the reflected light quantity of -primary diffracted light separately apart from the photodetection field for regenerative-signal detection is arranged, the difference of each detecting signal is taken, and a track error detecting signal is acquired. There are the method and means of **.

[0194](22B-1-4) The object lens (not shown) which makes the laser beam which emitted light from the objective lens actuator structure semiconductor laser element condense on the information storage medium 201 to the output current of the objective lens actuator drive circuit 218. It responds and has a structure movable in the biaxial direction. The move direction of this object lens moves to the perpendicular direction to the information storage medium 201 for - focus gap amendment, and moves to the radial direction of the information storage medium 201 for track gap amendment. Although not illustrated, the moving mechanism of an object lens is called an objective lens actuator. It is a method which the braid of an object lens and one moves along with a * axis sliding method:medial axis (shaft) if it is considered as objective lens actuator structure, A way a braid moves in the direction in alignment with a medial axis, perform focal gap amendment, and rotational movement of the braid on the basis of a medial axis performs track gap amendment. Or * 4 wire method: How for the braid of object lens one to be connected by four wire to the stationary system, and to move a braid in the biaxial direction using the elastic deformation of wire. ** -- it is used mostly.

[0195]Any method has a permanent magnet and a coil and it has structure to which a braid is moved by sending current through the coil connected with the braid.

[0196](22B-2) Equip with the information storage medium (optical disc) 201 on the rotating table 221 which rotates with the driving force of the roll control system spindle motor 204 of the information storage medium 201.

[0197]The regenerative signal acquired from the information storage medium 201 detects the number of rotations of the information storage medium 201. That is, the detecting signal (analog signal) of amplifier 213 output is changed into a digital signal in the binarization circuit 212, and generates a constant period signal (reference clock signal) by PLL circuit 211 from this signal. In the information-storage-medium rotational-speed-detection circuit 214, the number of rotations of the information storage medium 201 is detected using this signal, and that value is outputted.

[0198]The correspondence table of the information-storage-medium number of rotations corresponding to reproduction or the radius position recorded / eliminated is beforehand recorded on the semiconductor memory 219 on the information storage medium 201. If a playback position or record/elimination position is decided, the control section 220 will set up the target revolving speed of the information storage medium 201 with reference to semiconductor memory 219 information, and will notify the value to the spindle motor driving circuit 215.

[0199]The difference of this target revolving speed and the output signal (number of rotations in the actual condition) of the information-storage-medium rotational-speed-detection circuit 214 is searched for, and it controls by the spindle motor driving circuit 215 so that the driving current according to that result is given to the spindle motor 204 and the number of rotations of the spindle motor 204 becomes fixed. The output signal of the information-storage-medium rotational-speed-detection

circuit 214 is a pulse signal which has the frequency corresponding to the number of rotations of the information storage medium 201, and is controlled by the spindle motor driving circuit 215 to both the frequency of this signal, and a pulse phase.

[0200](22B-3) In order to move the optical head 202 to the radial direction of the optical head moving mechanism information storage medium 201, it has the optical head moving mechanism (feed motor) 203.

[0201]A guide shaft cylindrical as guide structure to which the optical head 202 is moved is used in many cases, and the optical head 202 moves using friction between the bushes attached to a part of this guide shaft and optical head 202. There is also a method using the bearing which made frictional force reduce using rotational movement in addition to it.

[0202]Although the transmitting-driving-force method of moving the optical head 202 is not illustrated, it arranges the rotary motor to which the pinion (rotation gear) was attached to a stationary system, The rack which is a linear shape gear which gears with a pinion has been arranged on the side of the optical head 202, and rotational movement of a rotary motor is changed into the straight-line motion of the optical head 202. As the other transmitting-driving-force method, the linear motor system which sends current through the coil which has arranged the permanent magnet to the stationary system and has been arranged to the optical head 202, and is moved in the linear direction may be used.

[0203]Current is sent through a feed motor and it is made to generate the driving force for optical head 202 movement fundamentally by any method of a rotary motor and a linear motor. This current for a drive is supplied from the feed motor drive circuit 216.

[0204](22C) In order to perform functional (22C-1) condensing spot trace control focus gap amendment of each control circuit, or track gap amendment, The circuit which supplies driving current to the objective lens actuator (not shown) in the optical head 202 according to the output signal (detecting signal) of the focal track error detector circuit 217 is the objective lens actuator drive circuit 218. In order to carry out the high speed response of the high frequency domain **** object lens movement, it has the phase compensation circuit for a characteristic improvement doubled with the frequency characteristic of the objective lens actuator inside.

[0205]In the objective lens actuator drive circuit 218, according to the command of the control section 220, to ON/OFF processing of * focus / track gap correction operation (a focus / track loop), and the perpendicular direction (focusing direction) of the * information storage medium 201 an object lens. Processing (it performs at the time of a focus / track loop OFF) to which it is made to move at a low speed, and processing which moves to the radial direction (direction which crosses a track) of the information storage medium 201 slightly using * kick pulse, and moves condensing spot to the next track are performed.

[0206](22C-2) Perform laser intensity control (22C-2-1) reproduction, change processing reproduction of record/elimination, and the change of record/elimination by changing the light volume of the condensing spot with which it irradiates on the information storage medium 201.

[0207]as opposed to the information storage medium using a phase change method -- general -- [light volume at time of record] >[light volume at time of elimination] > [light volume at the time of reproduction]

To the information storage medium ****** is realized and using the optical magnetic system, it is on a general target. [Light volume at the time of record] [Light volume at time of elimination] > [light volume at the time of reproduction]

There is ******. In the case of an optical magnetic system, the polarity of the external magnetic field (not shown) added to the information storage medium 201 at the time of

record/elimination is changed, and processing of record and elimination is controlled.

[0208]At the time of information reproduction, it is irradiating with fixed light volume continuously on the information storage medium 201.

[0209]In recording new information, it adds pulse form intermittent light volume on the light volume at the time of this reproduction. When a semiconductor laser element carries out pulse radiation with big light volume, the light reflex nature record film of the information storage medium 201 causes an optical change or a shape change locally, and a recording mark is formed. When carrying out overwrite on the field already recorded, pulse radiation of the semiconductor laser element is carried out similarly.

[0210]In eliminating the information already recorded, it carries out continuous irradiation of the bigger fixed light volume than the time of reproduction. In eliminating information continuously, it returns irradiation light quantity for every specific cycles, such as a sector unit, at the time of reproduction, and in parallel with erasing processing, information reproduction is performed intermittently. The track number and address of a track which are eliminated intermittently are reproduced, and erasing processing is performed, checking that there is no error of an erase track.

[0211](22C-2-2) Although a laser emission control graphic display is not carried out, build in the photodetector for detecting the light quantity of a semiconductor laser element in the optical head 202. In the semiconductor laser driving circuit 205, the difference of the photodetector output (detecting signal of semiconductor laser element light quantity) and the luminescence reference signal given from record / reproduction / erasing control waveform generating circuit 206 was taken, and the driving current to a semiconductor laser with a basis is fed back to the result.

[0212](22D) If it equips with the many operations (22D-1) start-control-information storage (optical disc) 201 about the control system of a working part on the rotating table 221 and start control is started, processing will be performed according to the following procedures.

[0213]1) Target revolving speed is told to the spindle motor driving circuit 215 from the control section 220, driving current is supplied to the spindle motor 204 from the spindle motor driving circuit 215, and rotation of the spindle motor 204 begins.

[0214]2) A command (executive instruction) is simultaneously taken out from the control section 220 to the feed motor drive circuit 216, driving current is supplied to the optical head drive mechanism (feed motor) 203 from the feed motor drive circuit 216, and the optical head 202 moves to the most-inner-circumference position of the information storage medium 201. It checks that the optical head 202 has been to the inner periphery further across the field where the information on the information storage medium 201 is recorded.

[0215]3) If the spindle motor 204 reaches target revolving speed, the status (condition report) will be taken out to the control section 220.

[0216]4) According to the amount signal of regenerated light sent to record / reproduction / erasing control waveform generating circuit 206 from the control section 220, current is supplied to the semiconductor laser element in the optical head 202 from the semiconductor laser driving circuit 205, and start laser emission.

[0217]* The optimal irradiation light quantity at the time of playback changes with kinds of information storage medium (optical disc) 201. At the time of starting, it is set as the value with the lowest irradiation light quantity of them.

[0218]5) Shift in the position which kept away most the object lens (not shown) in the optical head 202 from the information storage medium 201 according to the command from the control section 220, and the object lens actuator drive circuits 218 control to bring an object lens close to the information storage medium 201 slowly.

[0219]6) Monitor the amount of focal gaps simultaneously in the focal track error

detector circuit 217, when an object lens comes near the position whose focus suited, take out status and notify to the control section 220.

[0220]7) If the notice is got, a command will be taken out with the control section 220 so that a focal loop may be turned ON to the objective lens actuator drive circuit 218.

[0221]8) The control section 220 takes out a command to the feed motor drive circuit 216, turning ON a focal loop, and moves the optical head 202 in the direction of a peripheral part of the information storage medium 201 slowly.

[0222]9) Monitor the regenerative signal from the optical head 202 simultaneously, if the optical head 202 arrives at the record section on the information storage medium 201, movement of the optical head 202 will be stopped, and take out the command which makes a track loop turn on to the objective lens actuator drive circuit 218.

[0223]10) "The optimal light volume at the time of playback" and the "optimal light volume at the time of record/elimination" which are recorded on the inner periphery of the information storage medium (optical disc) 201 are played, and the information is recorded on the semiconductor memory 219 via the control section 220.

[0224]11) Furthermore, by the control section 220, send the signal doubled with the "optimal light volume at the time of reproduction" to record / reproduction / erasing control waveform generating circuit 206, and reset the light quantity of the semiconductor laser element at the time of reproduction.

[0225]12) According to the "optimal light volume at the time of record/elimination" currently recorded on the information storage medium 201, the light quantity of the semiconductor laser element at the time of record/elimination is set up.

[0226](22D-2] The information attached to on which place on the reproduction information storage 201 of the access destination information on the access control (22D-2-1) information storage medium 201 the information on what kind of contents is recorded changes with kinds of information storage medium 201, Generally, it collects and records on the inner circumference field or outer periphery area of the * directory management domain:information storage medium 201 in the information storage medium 201. ****** -- * navigation pack: -- it is contained in VOBS (Video Object Set) based on the data structure of PS (Program Stream) of MPEG 2, and the following image records where -- that information is recorded. It has recorded on ****.

[0227]An access point is determined from the information which reproduced the information in the above-mentioned field first and was acquired [reproduction or] in specific information there to record/eliminate.

[0228](22D-2-2) In the rough access control control section 220, it asks for the radius position of an access point by calculation, and the distance between the optical head 202 present positions is deduced.

[0229]The velocity curve information which can reach most to optical head 202 migration length in a short time is recorded in the semiconductor memory 219 a priori. The control section 220 reads the information and performs the movement controls of the optical head 202 by the following methods according to the velocity curve.

[0230]After taking out a command from the control section 220 to the objective lens actuator drive circuit 218 and turning off a track loop, the feed motor drive circuit 216 is controlled and movement of the optical head 202 is made to start.

[0231]If condensing spot crosses the track on the information storage medium 201, a track error detecting signal will occur in the focal track error detector circuit 217. The relative velocity of the condensing spot to the information storage medium 201 is detectable using this track error detecting signal.

[0232]In the feed motor drive circuit 216, the difference of the relative velocity of the condensing spot obtained from this focal track error detector circuit 217 and the target speed information sent in detail from the control section 220 is calculated, The optical

head 202 is moved for the result to the driving current to the optical head drive mechanism (feed motor) 203 with feedback or **.

[0233]" (22B-3]) As described to optical head moving mechanism", between the guide shaft, the bush, or the bearing, frictional force is always working. While the optical head 202 is moving at high speed, dynamical friction works, but since the movement speed of the optical head 202 is slow, static friction works the time of a move start, and just before a stop. since relative frictional force is increasing at this time, the amplification factor (gain) of the current supplied to the optical head drive mechanism (feed motor) 203 according to the command from the control section 220 is made to increase just before a stop especially --

[0234](22D-2-3) When the dense access control optical head 202 arrives at a target position, a command is taken out from the control section 220 to the objective lens actuator drive circuit 218, and a track loop is made to turn on.

[0235]Condensing spot reproduces the address or track number of the portion, tracing along the track on the information storage medium 201.

[0236]The present condensing spot position is deduced from the address or track number of a there, the error track number from an attainment target position is calculated within the control section 220, and a track number required for movement of condensing spot is notified to the objective lens actuator drive circuit 218.

[0237]If a 1-set kick pulse is generated in the objective lens actuator drive circuit 218, the information storage medium 201 will move slightly radially, and condensing spot will move an object lens to the next track.

[0238]A track loop is made to turn off temporarily, and after generating the kick pulse of the number of times doubled with the information from the control section 220, a track loop is made to turn on again in the objective lens actuator drive circuit 218.

[0239]It checks that the control section 220 reproduced the information on the position which condensing spot is tracing (an address or track number), and has accessed the target track after the end of dense access.

[0240](22D-3) The track error detecting signal outputted from the focal track error detector circuit 217 as shown in continuous recording / reproduction / erasing control drawing 20 is inputted into the feed motor drive circuit 216. In the feed motor drive circuit 216, it is controlled by the control section 220 not to use a track error detecting signal the "time" of mentioning above. ["time / access control / start control and /"]

[0241]After checking that condensing spot has arrived at the target track by access, a part of track error detecting signal is supplied via the motor drive circuit 216 by the command from the control section 220 as driving current to the optical head drive mechanism (feed motor) 203. This control is continued during the period which is performing reproduction, or record/erasing processing to continuation.

[0242]It is equipped with the center position of the information storage medium 201 with the eccentricity shifted as slightly as the center position of the rotating table 221. If a part of track error detecting signal is supplied as driving current, the optical head 202 whole will move slightly according to eccentricity.

[0243]If reproduction, or record/erasing processing is performed continuously for a long time, a condensing spot position will move in an outer peripheral direction or the direction of inner circumference gradually. When a part of track error detecting signal is supplied as driving current to the optical head moving mechanism (feed motor) 203, according to it, the optical head 202 moves in an outer peripheral direction or the direction of inner circumference gradually.

[0244]Thus, the burden of track gap amendment of an objective lens actuator is eased, and a track loop can be stabilized.

[0245](22D-4) Processing of an end control series is completed, and when terminating

operation, processing is performed according to the following procedures.

[0246]1) The command which makes a track loop turn off to the objective lens actuator drive circuit 218 is taken out from the control section 220.

[0247]2) The command which makes a focal loop turn off to the objective lens actuator drive circuit 218 is taken out from the control section 220.

[0248]3) The command which stops luminescence of a semiconductor laser element to record / reproduction / erasing control waveform generating circuit 206 is taken out from the control section 220.

[0249]4) Notify 0 as a reference rotational frequency to the spindle motor driving circuit 215.

[0250](22E) As opposed to the signal recorded on the signal-forms information storage medium 201 recorded on the flow (22E-1) information storage medium 201 of the record signal / regenerative signal to an information storage medium. * * which enables correction of the recorded information error resulting from the defect on the information storage medium 201 The dc component of a regenerative signal is set to 0. * which attains simplification of a reproducing processing circuit In order to satisfy a demand that information is recorded to the information storage medium 201 as with high density as possible, as shown in drawing 20, by the information storage regenerating section (physical system block), "addition of an error correction function" and "signal transformation (strange recovery of a signal) to recorded information" are performed.

[0251](22E-2) Information to record on the flow (22E-2-1) ECC (Error Correction Code) attached-processing information storage medium 201 of the signal at the time of record is inputted into the data I/O interface part 222 as the record signal d in the form of a live signal. This record signal d is recorded on the semiconductor memory 219 as it is, and performs attached processing of ECC as follows after that in the ECC encoding circuit 208.

[0252]The example of the ECC additional means which used the product code for below is described.

[0253]It puts the record signal d in order one line at a time one by one every 172Bytes within the semiconductor memory 219, and let them be 1 set of ECC blocks by 192 lines. this "line: -- 172x sequence: -- to the live signal (record signal d) in 1 set of ECC blocks which comprise 192Bytes", inner code PI of 10Bytes is calculated for every line of 172Bytes, and additional recording is carried out into the semiconductor memory 219. Furthermore, the numerals PO are calculated outside 16Bytes for every row of a Bytes unit, and additional recording is carried out into the semiconductor memory 219.

[0254]They are a total of 2366 Bytes(es) (2366=(12+1) x (172+10)) of one line by 12 lines which includes inner code PI as an example recorded on the information storage medium 201, and the outside numerals PO.
It records in 1 sector of an information storage medium as a unit.

[0255]In the ECC encoding circuit 208, if addition of inner code PI and the outside numerals PO is completed, the every 2366 Bytes signal for one sector will be read in the semiconductor memory 219, and it will transmit to the modulation circuit 207.

[0256](22E-2-2) In order to bring the dc component (DSV:Disital Sum Value) of a signal abnormal-conditions regenerative signal close to 0 and to record information with high density to the information storage medium 201, perform the signal abnormal conditions which are conversion of signal forms in the modulation circuit 207.

[0257]It has a translation table showing the relation between the original signal and the signal after abnormal conditions by modulation circuit 207 and demodulator circuit 210 inside. The signal transmitted from the ECC encoding circuit 208 is divided every two or more bits according to a modulation method, and it changes into another signal (code), referring to a translation table.

[0258]For example, when 8/16 abnormal conditions (RLL (2, 10) code) are used as a modulation method, two kinds of translation tables existed, and the translation table for reference is changed in detail so that the dc component (DSV:Disital SumValue) after abnormal conditions may approach 0.

[0259](22E-2-3) When recording a recording mark on the recording waveform generated information storage (optical disc) 201, "1" generally comes to the front end position and the back terminal position of a * mark length recording method:recording mark as a recording method.

* The recording method between marks : the center position of a recording mark is in agreement with the position of "1."

Two kinds of ** exist.

[0260]When mark length record is performed, there is the necessity of forming a long recording mark. In this case, if it continues irradiating with fixed time record light volume, the recording mark of wide "raindrops" shape will be formed only the rear of the accumulation effect of the light reflex nature record film of the information storage medium 201. In order to remove this evil, in forming a recording mark with long length, it divides into two or more recording pulses, or the recording waveform is changed stair-like.

[0261]In record / reproduction / erasing control waveform generating circuit 206, the above recording waveforms are created according to the record signal sent from the modulation circuit 207, and it is transmitting to the semiconductor laser driving circuit 205.

[0262](22E-3) As the formation of a flow (22E-3-1) binary and PLL circuit of the signal at the time of reproduction "(22B-1-1) signal detection by the optical head 202" described. The reflected-light-quantity change from the light reflection film or light reflex nature record film of the information storage medium (optical disc) 201 is detected, and the signal on the information storage medium 201 is played. The signal acquired with the amplifier 213 has an analog-spectrum form. The signal is changed into the digital signal of the binary which consists of "1" and "0" using a comparator in the binarization circuit 212.

[0263]The reference signal at the time of information reproduction is taken out from the regenerative signal acquired from here in PLL circuit 211. PLL circuit 211 builds in the oscillator of a frequency variable. Comparison of the frequency and the phase between the pulse signal (reference clock) outputted from the oscillator and binarization circuit 212 output signal was performed, and the result is fed back to the oscillator output.

[0264](22E-3-2) It has a translation table showing the relation between the signal with which the recovery abnormal conditions of the signal were carried out, and the signal after a recovery by demodulator circuit 210 inside. A signal is returned to the original signal, referring to a translation table according to the reference clock obtained in PLL circuit 211. The returned signal (it got over) is recorded on the semiconductor memory 219.

[0265](22E-3-3) To the signal saved at the error correction processing semiconductor memory 219, using inner code PI and the outside numerals PO, detect an error part and set the pointer flag of an error part in the error correction circuit 209.

[0266]Then, according to an error pointer flag, the signal of an error part is corrected one by one, reading a signal from the semiconductor memory 219, inner code PI and the outside numerals PO are removed, and it transmits to the data I/O interface part 222.

[0267]The signal sent from the ECC encoding circuit 208 is outputted as the regenerative signal c from the data I/O interface part 222.

[0268]Next, while a flow chart figure is shown, each operation of the information storage playback equipment for video information record (VCR) is explained.

[0269]The data input of the still picture file explaining the procedure which uses Drawing 1 and records the still picture of two or more sheets on an information storage medium from the digital camera 1543 is continuously carried out to below (ST1).

[0270]The still picture file from the digital camera 1543 is the still picture information inputted since it was generally recorded by JPEG form, bit map format, etc. with the V encoder 1553 MPEG 2 It changes into I-Picture data (ST2). Next, the VOBU structure which had a data structure like drawing 3 to the still picture information of one sheet by the formatter 1556 is created, and two or more still pictures are packed and VOB (carrying out a grouping) is made to constitute (ST3).

[0271]All the Control Information 1011 which record and are in the information storage medium (optical disc) 201 by the information storage regenerating section 101 in parallel with the above-mentioned processing Information is played and the information is saved at the RAM part in the system control part 1530 (ST4). Control Information 1011 saved in system control part 1530 inside at the RAM part The information on Allocation Map Table 1105 is looked for out of information, and the place of the non-record section 1460 is looked for (ST5).

[0272]Then, control information is sent to the formatter 1556, the data processor 1536, and the information storage regenerating section 101 from the system control part 1530, and VOB which had two or more still picture information in the information storage regenerating section 101 is made to record on the non-record section 1460 (ST6).

[0273]At the time of record, the system control part 1530 monitors a recording situation, and it is judged whether record of VOB to the information storage medium (optical disc) 201 was successful. (ST7) When a trouble occurs on the way, processing of ST4-ST6 is repeated.

[0274]When record of VOB to the information storage medium (optical disc) 201 is successful, VOBU Map1738 (or VOB Map1899) is created within the system control part 1530 based on the address information recorded on the information storage medium (optical disc) 201 (ST9). The information storage regenerating section 101 is used for VOBU Map1738 (or VOB Map1899) information finally created within the system control part 1530, and it is Control Information 1011 on the information storage medium (optical disc) 201. Additional recording is carried out inside (ST10).

[0275]Next, the reproduction procedure of the still picture information which includes speech information using drawing 22 is explained.

[0276]ST4 of Drawing 1, and all the Control Information 1011 which record and are in the information storage medium (optical disc) 201 by the information storage regenerating section 101 first like ST5 Information is played and the information is saved at the RAM part in the system control part 1530 (ST11). Next, Control Information1011 saved in system control part 1530 inside at the RAM part The information on Playback Control Information 1021 is looked for out of information, and the information about a regeneration method is interpreted (ST12). then, in system control part 1530 inside, it saved at the RAM part looking for the program of information to reproduce out of PGC Control Information 1103 -- the -- Cell contained in PGC information is extracted. Next, it corresponds from Cell PlaybackInformation1108 saved at the RAM part. VOB_ID or PTT_ID specified by Cell is extracted (ST13). In system control part 1530 inside, it saves at a RAM part. certain Video Object Information 1107 or Video Title Set Information 1106 -- VOB to reproduce from inner Part_of_Titles Information 1753. [record and] It is. Optical Disk 1001 The upper address is extracted (ST14). Be shown in drawing 14 at the time of reproduction. The still picture information itself is reproduced from VOB#A, and it is it. VOB#B The reproduction procedure in the case of displaying in piles the speech information which record and is inside is explained. On the information storage medium

(optical disc) 201, the optical head 202 in the information storage regenerating section 101 is made to access based on the control signal from the system control part 1530, and it is [record and]. Play the information on VOB#B and. The speech information for the still picture of two or more sheets is stored temporarily in the memory 1563 from the inside (ST15). Next, on the information storage medium (optical disc) 201, record and it is. The optical head 202 in the information storage regenerating section 101 is made to access to the information storage position of VOB#A, and the still picture information in VOB#A is played (ST16). It is by the AV output 1546 to the last. VOB#B Inner speech information VOB#A Inner still picture information is outputted simultaneously (ST17). (display)

[0277]Only the speech information for the still picture of two or more sheets reproduces one only of the still picture information collectively (two or more sheets) as mentioned above, The remaining information is reproduced collectively after saving the memory 1562 for a reproduction result, Compared with the method of reproducing the still picture information and speech information for every still picture information of one sheet by performing the method of outputting simultaneously (display) each time, the access frequency of the optical head 202 is reduced substantially, The big feature of this invention is in the place where a seamless consecutive output (it does not stop at the display change of a still picture temporarily, or speech information does not break off) becomes possible as a result. With therefore, drawing 22 After reproducing the speech information of VOB#B Although the still picture information of VOB#A is reproduced, change (for example, reproduction orders interchange) in the range in which the main point of this invention does not collapse is possible. In drawing 10, it is a recording format saved by still picture information and speech information becoming a pair in VOBU. However, in the situation where the main point of not only this but the above-mentioned invention is carried out, the contents of this invention are adapted. for example, 1 VOB -- inside or 1 PTT -- collecting at the inner first half -- two or more sheets V_PCK is arranged and, It is for two or more sheets in the second half. In the case of the recording format collectively arranged by A_PCK, on the information storage medium (optical disc) 201, it is a still picture of the same number. V_PCK and A_PCK The position of a between is separated. Therefore, it is the same. VOB Even when reproducing the inner still picture information (V_PCK information) and speech information (V_PCK information) of the same still picture number one by one, the access processing of the optical head 202 is needed. therefore -- above -- 1 VOB -- inside or 1 PTT -- collecting at the inner first half -- two or more sheets V_PCK is arranged and, When A_PCK for two or more sheets reproduces the still picture information of Picture Objects 1013 with the recording format arranged collectively to two or more sheets in the second half, according to the procedure of this invention, Previously V_PCK information V_PCK Either of the information can be first read by two or more sheets, and it can save in the memory 1563, and the information on the after that remainder can be reproduced collectively, and it can output simultaneously (display).

[0278]How to carry out additional recording of the additional information over the still picture by after recording as other examples of this invention is explained. Additional information by after recording is made into a group (another VOB or another PTT) different from the original still picture information, and a synthetic output (display) is carried out by the method shown in drawing 14 at the time of reproduction. ST14 passes through the same procedure as drawing 22. On the information storage medium (optical disc) 201, the optical head 202 in the information storage regenerating section 101 is made to access based on the control signal from the system control part 1530, and it is [record and]. The information on VOB is played and it displays on the AV output 1546

like drawing 11 (ST18). Next, while a user looks at a display screen, additional information is inputted, the grouping of parts for two or more still picture is carried out by the formatter 1556 based on the inputted information, and VOB or PTT is constituted (ST19). The VOB information created by the formatter 1556 is recorded on the information storage medium (optical disc) 201 (ST20).

[0279]Next, the characteristic portion of this invention is described collectively.

[0280]*] 1VOB is two or more still picture information -- or -- 1PTT -- two or more still picture information it is .

[0281]*] It is a device which continues and records the still picture information of at least two sheets on free space at 1VOB at the time of two or more still picture records.

[0282]*] The continuous still picture information of two or more sheets can be specified by Cell Information.

[0283]The three above-mentioned effects of * are common.

[0284]That is, in a highly efficient digital camera, the still picture of what 1000 sheets and what 10,000 sheets is recordable. When data transfer is carried out to an optical disc, processing of the direction which carried out the grouping every two or more sheets, and recorded data on the optical disc becomes easy, and transfer time is short.

[0285]In a highly efficient digital camera, the still picture of what 1000 sheets and what 10,000 sheets is recordable. VOB is constituted for every still picture per sheet, and management information becomes huge if VOB Information was created. Management information can reduce substantially by this invention method.

[0286]Since the still picture information in every sheet was a separate file in the digital camera, management search was complicated. In order to carry out a grouping every two or more sheets by this invention, management and search become easy.

[0287]In a digital camera, since the still picture information in every sheet was a separate file, unless it opened the file per piece, the check of the contents of a still picture was not completed. The content confirmation of the user can be carried out in ease which looks at the positive film (or negative film) of a photograph like drawing 11 by carrying out a grouping every two or more sheets by this invention.

[0288]The video information over two or more video frames is recorded per VOB. By recording two or more still picture information per VOB, video information and still picture information can be treated on the same hierarchy, for example, it becomes possible for the ability to carry out the mixture arrangement of Cell of video information, and the Cell of still picture information in one PGC to mixture display of video information and still picture information, and expressional width increases.

[0289]*] this invention -- VOBU Map -- or -- There is existence of VOB Map.

[0290]*] VOBU Map -- or -- Information storage playback equipment which records VOB Map The two > above-mentioned effects of * are common.

[0291]the information on the recording address for every one still picture, etc. is recorded VOBU Map -- or -- Access becomes possible direct and the access speed for the display to two or more still pictures is substantially accelerated to a still picture to see using VOB Map.

[0292]When displaying two or more still pictures continuously, a seamless (**** [the knot between still pictures]) display is attained by using PTM and SCR information.

[0293]There records and is the still picture itself. Since the start address of A_PCK which records and has V_PCK and speech information is indicated independently, when only still picture information wants to reproduce only speech information, it becomes easy high-speed to access it. A seamless display is attained when, using the speech information in specific VOB for the still picture display of another VOB to multi as a result (since only speech information can be accessed at high speed).

[0294]*] The subject specified by Cell Information in this invention is each still picture

in VOB. For this reason, a seamless display is attained, when it can access at high speed and displays two or more still pictures one by one, since each still picture itself can be specified at the time of reproduction (using VOBU Map or VOB Map).

[0295]Since each still picture itself can be specified at the time of reproduction, the management at the time of reproduction becomes very easy, and processing when displaying the still picture of two or more sheets on a screen at once like drawing 11 becomes easy.

[0296]*] Multi-specification of still picture information in VOB which is different by Cell Information in this invention is possible. It is.

[0297]For this reason, since the continuous speech information in one VOB can be used at the time of another display of VOB, width is born to a mode of expression.

[0298]Since the continuous speech information in one VOB can be used at the time of another display of VOB, combination-ization of data can be attained and space-saving-ization of the data volume recorded on an information storage medium (Optical Disk 1001) can be promoted. As a result, a substantial recordable quantity of per the information storage medium (Optical Disk1001) of one sheet increases substantially.

[0299]It is Video Objects 1012 to the video information which already records and exists. Without processing the very thing entirely, Only by carrying out new production, corresponding Video Object Information for Picture Objects can already be used, combining a certain video information as still picture information.

[0300]*] Cell Info. is reproduced in this invention and a still picture is reproduced using VOBI. .

[0301]For this reason. Picture Objects 1013. Since Cell Playback Information for PictureObjects can be uniquely set to Video Object Information for Picture Objects which is the management information of the contents. Since reproduction orders can be specified regardless of the turn recorded on the information storage medium (Optical Disk 1001) of the still picture, expressional flexibility improves by leaps and bounds.

[0302]*] It is a device which carries out memory reading of this invention, still picture information, or the speech information, and reproduces both simultaneously.

[0303]The case where different still picture information in VOB is multi-specified, and when being collectively recorded on another field by only the speech information of the still picture of two or more sheets, every still picture of one sheet -- each time -- If V_PCK, SP_PCK, and A_PCK were reproduced one by one, when access frequency increases dramatically and displays the still picture of two or more sheets one by one, a successive indication (influenced by the access waiting time of the optical head 202) becomes difficult.

[0304]If the information for at least two sheets is reproduced at once to either among V_PCK, SP_PCK, and A_PCK, it saves in the memory 1563 to it temporarily and it displays simultaneously at the time of the remaining information reproduction, the access frequency of the optical head 202 will fall substantially, and a successive indication will become easy.

[0305]*] It is a postrecording recorder which records the additional information to this invention and a recorded still picture collectively.

[0306]For example, if the still picture information photoed with the digital camera without a voice input function is recorded on an information storage medium (Optical Disk 1001) as it is, the record result has structure which does not contain A_PCK (Audio Pack) as shown in drawing 10 (c3). The information is reproduced, and the case where description and a comment are added to every sheet by methods, such as "voice input with a microphone", "overwrite of the mark by handwriting", and "an addition of the text information by key in", is considered, carrying out a screen display like drawing

11. In this case, like [of the structure which does not include a recording format for A_PCK of drawing 10 (c3) to drawing 10 (b3)] If you are going to make it change to the structure containing A_PCK, makeup processing of the record to up to an information storage medium (Optical Disk1001) will occur, Processing becomes troublesome and processing time will start substantially. It is shown in drawing 10 (c3) to it. Without modifying the data which does not contain A_PCK (Audio Pack), An exception like drawing 10 (d) only for additional information VOB 1634 is used and it is an information storage medium. (Optical Disk 1001) If it records above, after receiving a still picture, it can carry out in that the adding processing of information is very easy, and a short time.

[0307]The focus more concretely contained in this system is described.

[0308]In the information storage medium which this invention reproduces [record and] at least, [of still picture information] The 1st information unit [VOBU 1641-1649] that has the still picture information of one sheet, Have the 1st group unit [VOB 1632-1634 thru/or PTT 1407 and 1408] that has the still picture information of the contents from which it is constituted by the aggregate of said 1st information unit, and plurality differs, and. Two or more still pictures, wherein said thing [that information is recorded per 1st group] are the information storage media recorded continuously.

[0309]Here, the above-mentioned still picture information contains either at least among video information [V_PCK1664] etc., sub video information [SP_PCK1682] etc., and speech information [A_PCK1693] etc.

[0310]the 1st information unit -- VOBU (Video Object Unit) or VOB (Video Object) -- it comprising either at least and, and the 1st group unit -- VOB (Video Object) or PTT (Part_of_Title) -- it comprises either at least.

[0311]In [to an information storage medium] record and refreshable information storage playback equipment in the device of this invention still picture information, The non-record section primary detecting element [system control part 1530] which looks for the non-record section [sheep record section 1460] on an information storage medium, The grouping part [formatter 1556] of two or more still pictures which carry out the grouping of two or more inputted still picture information, The information storage regenerating section [information storage regenerating section 101] which records two or more still picture information by which the grouping was carried out [above-mentioned] to the non-record section on the information storage medium detected by the above-mentioned sheep record section primary detecting element on an information storage medium is provided, a grouping -- carrying out -- having had -- plurality -- still picture information -- inside -- at least -- two -- a sheet -- still picture information -- [-- for example, -- VOBU -- 1642 -- 1643 --] -- an information storage medium -- a top -- mutual -- having approached -- a field -- inside -- [-- for example, -- being the same -- Extent -- # -- delta -- 1474 -- inside -- continuing -- recording -- having --] -- continuing -- recording -- having .

[0312]The recording medium of this invention is an information storage medium in which record and reproduction of still picture information are possible at least, The still picture information itself. In the information storage medium [Optical Disk 1001] which has the 2nd record section [Control Information] that records the management information about the 1st record section [Picture Objects 1013] and still picture to record, The 1st information unit [VOBU 1641-1650] that has the still picture information in every sheet, Have the 1st group unit [VOB 1632-1634 thru/or PTT 1407 and 1408] that has the still picture information of the contents from which it is constituted by the aggregate of said 1st information unit, and plurality differs, and. Still picture information is recorded on the 1st record section of the above per 1st [said] group, And the map information [VOBU Map for Picture Objects 1738 or VOB Map

for Picture Objects 1899] on which the management information about the still picture information in every sheet related to the 1st information unit of the above was recorded. Two or more still pictures which it has are recorded continuously.

[0313]The device of this invention is a device which reproduces the information storage medium in which record and reproduction of still picture information are possible at least, As opposed to the information storage medium which has the 2nd record section [Control Information 1011] that records the management information about the 1st record section [Picture Objects 1013] and still picture that record the still picture information itself. In the information storage playback equipment which records the management information about still picture information and a still picture, The record section primary detecting element [system control part 1530] which detects the place [sheep record section 1460] which records two or more still picture information on an information storage medium, The grouping part [formatter 1556] which collects two or more 1st information units [VOBU 1641-1649] that have the still picture information of one sheet, and forms the 1st group unit [VOB 1632-1634 thru/or PTT 1407 and 1408], The information storage regenerating section [information storage regenerating section 101] which records the 1st group unit by which the grouping was carried out [above-mentioned] on the extracted information storage medium by the above-mentioned record section primary detecting element, To each still picture information within the above-mentioned 1st group unit. The management information preparing part [system control part 1530] which creates the related management information [VOBU Map for Picture Objects 1738 or VOB Map forPicture Objects 1899], It has management information Records Department [information storage regenerating section 101] which records the management information about each still picture information created by the above-mentioned management information preparing part in the 2nd record section [Control Information 1011] of the above.

[0314]The 1st record section [Picture Objects 1012] that the recording medium of this invention is an information storage medium in which record and reproduction of still picture information are possible at least, and records the still picture information itself, It has the 2nd record section [Control Information 1011] that records management information, And the 1st control information recording area [Video Object Information 1107] where the information about the recorded state on the information storage medium of the still picture information recorded in the management domain of the above 1st was recorded in the record section of the above 2nd, In the information storage medium which has the 2nd control information recording area [Playback Control Information 1021] where the information about the regeneration method in the case of reproducing the still picture information recorded in the record section of the above 1st was recorded, In the control information recording area of the above 2nd, the minimum unit information [Cell Playback Information 1108] which reproduces the above-mentioned still picture information is recorded, and. The still picture itself reproduced using the above-mentioned minimum unit information is specified. Video Pack of the first still picture within [Cell records. It is. VOB Video Pack of the still picture of the inner still picture number 1875 and the last within Cell records. existing VOB -- the inner still picture number 1876 -- or -- Video Pack of the first still picture within Cell. [record and] It is. PTT Video Pack of the still picture of the inner still picture number 1885 and the last within Cell records, and there is. PTT Inner still picture number 1886] It carries out.

[0315]Here, Using the minimum unit information [Cell Playback Information 1108] recorded in the 2nd control information recording area [Playback Control Information 1021] of the above. It has and has structure [whose specification of the still picture information of two or more sheets in the meantime is enabled by specifying the still

picture number of the beginning in Cell, and the last] of specifying the still picture information of two or more sheets recorded continuously.

[0316]The 1st information unit [VOBU 1641-1649] that the recording medium of this invention is an information storage medium in which record and reproduction of still picture information are possible at least, and has the still picture information in every sheet, With the aggregate of said 1st information unit. Two or more still picture information is recorded on the 1st record section [Video Objects 1012] of the above in the 1st group unit [VOB 1632-1634 thru/or PTT 1407 and 1408] that has the still picture information of the contents from which it is constituted and plurality differs, And the information [Video Object Information 1107] about the recorded state recorded per group of the above 1st is recorded on the 1st control information recording area [Control Information 1011] of the above.

[0317]And within the minimum unit information [Cell Playback Information 1108] which reproduces the above-mentioned still picture information currently recorded in the 2nd control information recording area [Playback Control Information 1021] of the above, Control information recording area [Video of the above 1st. Specify the still picture [still picture numbers 1875, 1876, 1885, and 1886] in the 1st group [VOB 1632-1634 thru/or PTT 1407 and 1408] currently recorded in ObjectInformation 1107], and reproduce still picture information, and. The still picture position [still picture number j:VOBU1828, still picture number h+j-2:VOBU1829] in the 2nd different group [VOB#B1822] from the inside of the 1st group [VOB#A1821] currently recorded in the control information recording area of the above 1st is specified. Speech information or sub video information is reproduced simultaneously.

[0318]The playback equipment of this invention has an information reproduction means [information storage regenerating section 101] and an information display means [record playback video recorder indicator 1548], The information about the regeneration method currently recorded on the 2nd control information recording area [Playback Control Information 1021] in the information reproduction means [information storage regenerating section 101] is reproduced, Next, the information about the recorded state on the information storage medium currently recorded on the above-mentioned reproduction result by the 1st control information recording area [Video Object Information 1107] of **** with a basis is reproduced, Then, the still picture information currently recorded on the above-mentioned reproduction result by the 1st record section [Picture Objects 1013] of **** with a basis is reproduced, and the above-mentioned reproduction information is displayed by the above-mentioned information display means [AV output 1546].

[0319]The playback equipment of this invention and two or more still picture information are recorded per group [VOB#A1821, VOB#B1822], Said still picture information And video information [V_PCK1852, 1854], As opposed to the information storage medium which contains either at least among sub video information [SP_PCK1848] and speech information [A_PCK1865, 1866], The regenerating section [information storage regenerating section 101] which summarizes either at least more than at least two sheets [the still picture number 2, still picture (not shown) number 3, or still picture number j and still picture (not shown) number j+1], and is reproduced, The storage parts store [memory 1563] which stores temporarily the information reproduced by the above-mentioned regenerating section, Video information [V_PCK1852, 1854], sub video information [SP_PCK1848], it is not recorded on the above-mentioned storage parts store among speech information [A_PCK1865, 1866] -- the indicator [AV output 1546] which displays simultaneously the information which the remaining information was reproduced by the regenerating section [information storage regenerating section 101], and was reproduced [above-mentioned], and the information

recorded on the above-mentioned storage parts store is provided.

[0320]The 1st information unit [VOBU 1641-1649] in which the postrecording recorder of this invention has the still picture information of one sheet, Have the 1st group unit [VOB 1632-1634 thru/or PTT 1407 and 1408] that has the still picture information of the contents from which it is constituted by the aggregate of said 1st information unit, and plurality differs, and. As opposed to the information storage medium with which two or more still pictures, wherein said thing [that information is recorded per 1st group] are recorded continuously, The additional information input means [AV input 1542 ->ADC1552 / A encoder 1554, or SP encoder 1555] added to the still picture information [VOBU 1825-1827] in every sheet, Momentary Records Department [temporary storage part 1534] which records temporarily the additional information added to the still picture information in every sheet, The additional information synthesizing means [formatter 1556 and data processor 1536] summarized per group [VOB 1632-1634 thru/or PTT 1407 and 1408] of the above 1st to the additional information added to the still picture information in every sheet, An information storage means [information storage regenerating section 101] to summarize the synthetic information created by the above-mentioned additional information synthesizing means on an information storage medium, and to record it is provided.

[0321]
[Effect of the Invention]As explained above, according to this invention. A) the recording which secured a DVDVideo disk, and a certain amount of compatibility and continuity, securing the recording format between the general image methods, the data consistency of management information, and continuity in a refreshable DVD disk. The recording format for dealing with two or more still picture information, the data structure of management information, and the method that made it possible were able to be obtained. The recording format for making easy management and search to two or more still picture information of which B record was done, the data structure of management information, and the method that made it possible were able to be obtained. By enabling high-speed access to the information storage medium with which the still picture information of C plurality was furthermore recorded, the information reproducing device for enabling the display of two or more [continuously] still picture information [be / no intermission] (continuity at the time of reproduction) was able to be obtained.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The data structure explanatory view on the information recording medium concerning this invention.
[Drawing 2]The directory configuration explanatory view of the data file in a data area.
[Drawing 3]The data structure explanatory view in AV file.
[Drawing 4]The explanatory view of the recording place of a video object in alignment with arrangement on an information storage medium.
[Drawing 5]The data structure explanatory view in an allocation map table.
[Drawing 6]The data structure explanatory view within program chain control information.
[Drawing 7]The explanatory view of the example of video information reproduction using PGC.
[Drawing 8]The data structure explanatory view in VTSI.
[Drawing 9]The explanatory view of the VOB arrangement order according to VOBI.

[Drawing 10]The recording format explanatory view of a picture object / audio object.

[Drawing 11]The figure showing the example of the display screen to a picture object data structure.

[Drawing 12]The data structure explanatory view within video object information.

[Drawing 13]The data structure explanatory view in [VOBU] a picture object.

[Drawing 14]The related explanatory view between the contents of specification of the data structure in VOB which can be put on a continuous-static-images sequence, and the corresponding cell.

[Drawing 15]The data structure explanatory view within the cell reproduction information of a picture object.

[Drawing 16]Other data structure explanatory views within the cell reproduction information of a picture object.

[Drawing 17]The data structure explanatory view within the par TOOBU title information about a still picture.

[Drawing 18]The data structure explanatory view in the VOB map of a picture object.

[Drawing 19]The block configuration explanatory view in a video decoder.

[Drawing 20]The composition explanatory view of a physical system block of information storage playback equipment.

[Drawing 21]The explanatory view of the procedure which records the still picture of two or more sheets on an information recording medium.

[Drawing 22]The explanatory view of the reproduction procedure of the still picture information from an information recording medium.

[Drawing 23]The explanatory view of the record procedure of the additional information by after recording.

[Description of Notations]
201 -- An information recording medium, 101 -- An information storage regenerating section, 1500 -- Disk changer part, 1530 -- A system control part, 1534 -- A temporary storage part, 1536 -- Data processor, 1538 -- An STC section, 1542 -- AV input part, 1543 -- Digital camera, 1544 -- TV tuner, 1548 -- A record playback video recorder indicator, 1552 -- Analog-to-digital converter, 1553 -- A video encoder, 1554 -- An audio encoder, 1555 -- Sub video image encoder, 1556 -- A formatter, 1557 -- A buffer memory, 1562 -- Separator, 1563 [-- A video digital-analog converter, 1568 / -- An audio decoder, 1569 / -- Audio digital-analog converter.] -- A memory, 1564 -- A video decoder, 1565 -- A sub video decoder, 1567